SHARP Service Manual

APSS
Auto Program Search System

STEREO RADIO CASSETTE RECORDER

MODEL GF-8181H

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

SPECIFICATIONS

GENERAL DESCRIPTION

Type:	Portable stereophonic cassette tape recorder with built-in LW/MW/SW/FM 4-band radio
Power source:	A.C. 110/220/240V, 50/60Hz D.C. 9V (Six UM/SUM-1 Batteries)
Speakers:	10cm x 2
Output power:	MPO 8000mW (4000mW + 4000mW; AC operation) RMS power 4000mW (2000mW + 2000mW; DIN 45 324, DC operation)
Semiconductors:	3-IC (Integrated circuit) 36-Transistor 29-Diode 1-LED
Dimensions:	Width: 368mm (14-1/2") Depth: 110mm (4-1/4") Height: 210mm (8-1/4")
Weight:	4.1 kg (Without batteries) 9 lbs
Input terminals:	External microphone jack Remote control jack External DC power jack AC socket Record/playback socket
Output terminals:	External speaker jack Headphones jack Record/playback socket

TAPE RECORDER SECTION

Type:	4-track stereo cassette tape recorder
Tape:	Philips type compact cassette tape
Tape speed:	4.8cm/sec. (1-7/8 i.p.s.)
Recording system:	AC bias
Erasing system:	DC erasing
Recording time:	60 minutes (with C-60 tape)
Fast forward or rewind time:	100 sec. (with C-60 tape)
Frequency response:	40 ~ 15,000Hz (CrO_2 tape)
S/N ratio:	45dB
Wow & flutter:	0.3% (DIN)

RADIO SECTION

Frequency range:	LW	150 ~ 285kHz
	MW	520 ~ 1,620kHz
	SW	5.95 ~ 18MHz
	FM	87.6 ~ 108MHz
Intermediate frequency:		
	LW/MW/SW	455kHz
	FM	10.7MHz
Circuit system:	4-band superheterodyne system	
Antenna:	LW/MW Ferrite core bar antenna SW/FM Telescopic rod antenna	

Specifications are subject to change without prior notice.

SHARP CORPORATION OSAKA, JAPAN

PARTS IDENTIFICATION (Refer to Figure 2-1 and Figure 2-2)

1. A.P.S.S. indicator, PL1 (RLMPM0020AFZZ)
2. Battery condition/tuning/record level meter, ME1 (RMTRE0058AFZZ)
3. FM stereo indicator, D10 (VHPREDLIT503F)
4. Tuning control knob (JKNBN0365AFSA)
5. Built-in microphone (Right channel) (RMICC0057AFZZ)
6. Digital tape counter (KCOUB0070AFZZ)
7. Cassette holder (GFTAC1079AFSA)
8. Built-in microphone (Left channel) (RMICC0057AFZZ)
9. Mode selector switch, SW5 (QSW-B0093AFZZ)
10. Function selector switch, SW3 (QSW-B0092AFZZ)
11. Tape selector switch, SW4 (QSW-B0094AFZZ)
12. Telescopic rod aerial (antenna) (QANTR0109AFZZ)
13. Volume control knob (JKNBK0156AFSB & JKNBN0293AFSA)
14. Tone control knob (JKNBN0301AFSA)
15. Band selector knob (JKNBN0159AFSA)
16. Pause key (JBOTN0062AFSA)
17. Stop/eject key (JBOTN0062AFSA)
18. Play key (JBOTN0062AFSA)
19. Fast forward key (Forward APSS key) (JBOTN0062AFSA)
20. Rewind key (Reverse APSS key) (JBOTN0062AFSA)
21. Record key (JBOTN0062AFSA)
22. Voltage selector switch, SO3 (QSOCE0551AFZZ)
23. External DC power jack, J2 (QJAKC0007AGZZ)
24. Battery compartment lid (GFTAB1092AFSB)
25. Remote control jack, J1D (QJAKH0068AF00)
26. External microphone jack, J1A & J1B (QJAKH0068AF00)
27. Record/playback socket, SO2 (QSOCD2554AFZZ)
28. Headphones jack, J1C (QJAKH0068AF00)
29. External speaker jack, J3 & J4 (QJAKA0026AGS)
30. AC socket, SO1 (QSOCA0255AFZZ)
31. Beat canceller switch, SW12 (QJAKH0068AF00)

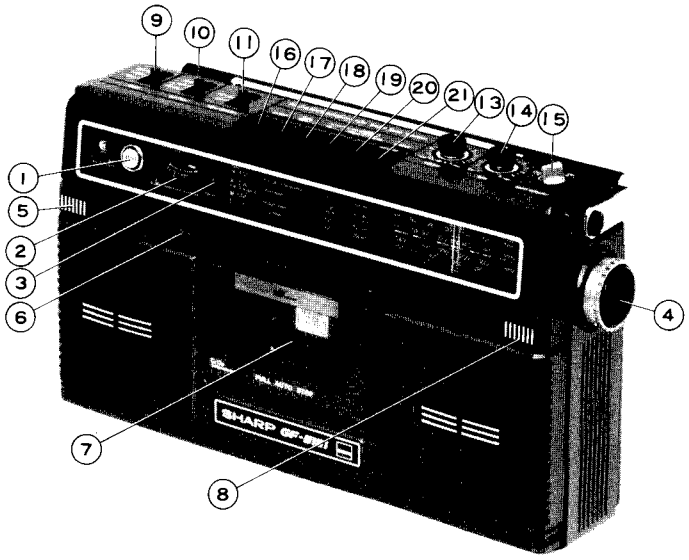


Figure 2-1

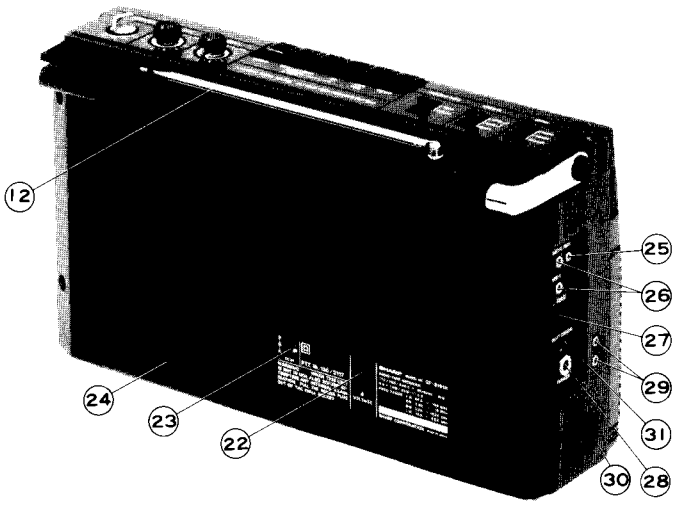


Figure 2-2

AC VOLTAGE SELECTION (Refer to Figure 3–1)

Check the preset voltage before connecting the AC cord plug to a AC wall outlet. If the setting is different from your local supply voltage, voltage selector must be re-set as follows: Rotate voltage selector by using a screwdriver so that your local voltage number can be seen.

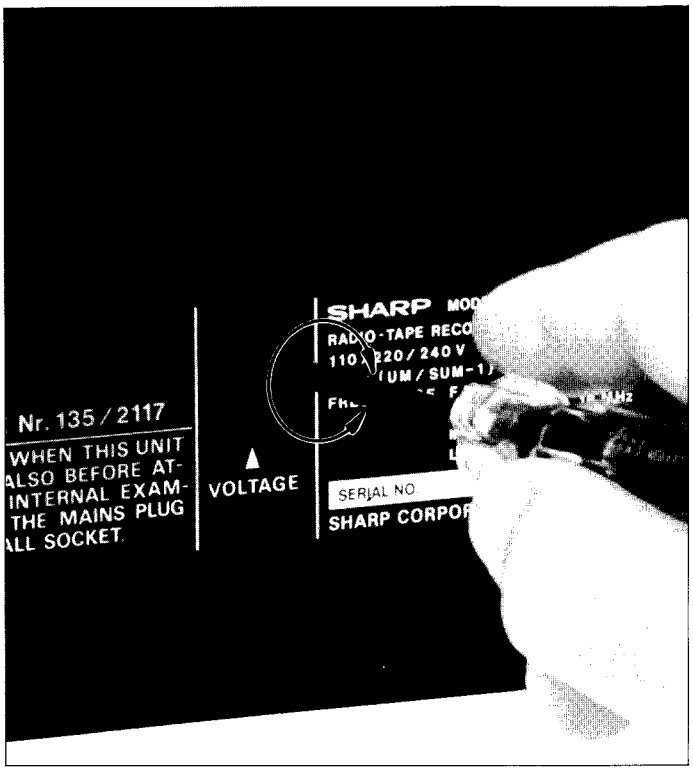


Figure 3-1

AC OPERATION (Refer to Figure 3–2)

Insert the connector at the other end of the lead into the socket at the side of the set and the plug you have just fitted into a convenient AC wall outlet. The set is now ready for use.

WARNING
The voltage to be used must be the same as specified on this tape recorder. Using this tape recorder with a higher voltage than that which is specified is dangerous and may result in a fire or other type of accident causing damage.
SHARP is not responsible for any damage resulting from use of this tape recorder with a voltage other than that which is specified.

Notes:
1) Inserting the AC connector into the side of the set automatically disconnects the batteries.
2) To conserve batteries you are advised to used the AC supply whenever possible.
3) When the unit is used on batteries, remove the AC connector from the side of the set.

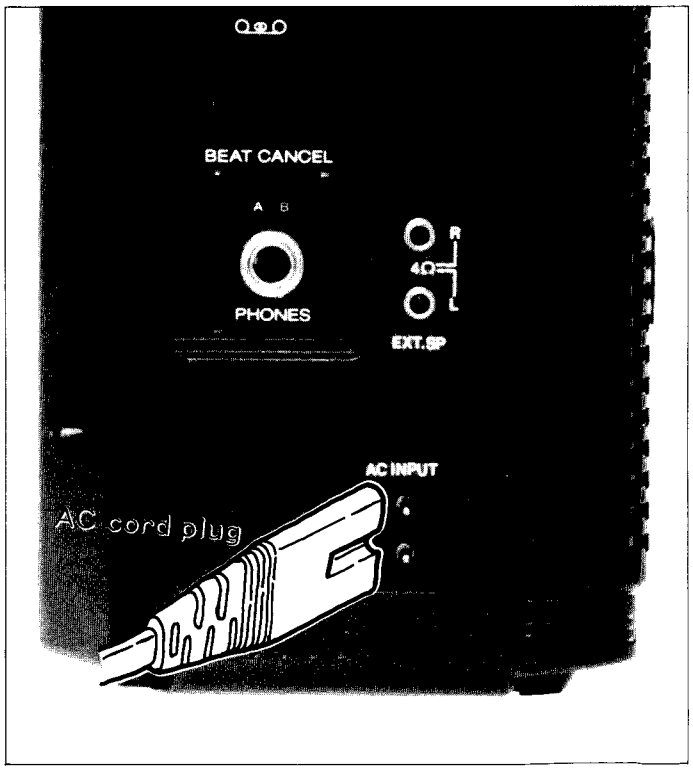


Figure 3-2

CABINET DISASSEMBLY (Refer to Figure 4–1 and Figure 4–2)

1. Pull out the AC cord plug and car battery adaptor plug from the unit.
2. Take out the cassette tape from the cassette holder and six batteries from the battery compartment.
3. Remove the volume control, tone control, band selector and tuning control knobs.
4. Remove six screws retaining the back cabinet and lightly open it.
5. Disconnect the tip connected to the tuner printed wiring board, and two tips connected to the mains supply printed wiring board.
6. Remove seven screws retaining the front cabinet.

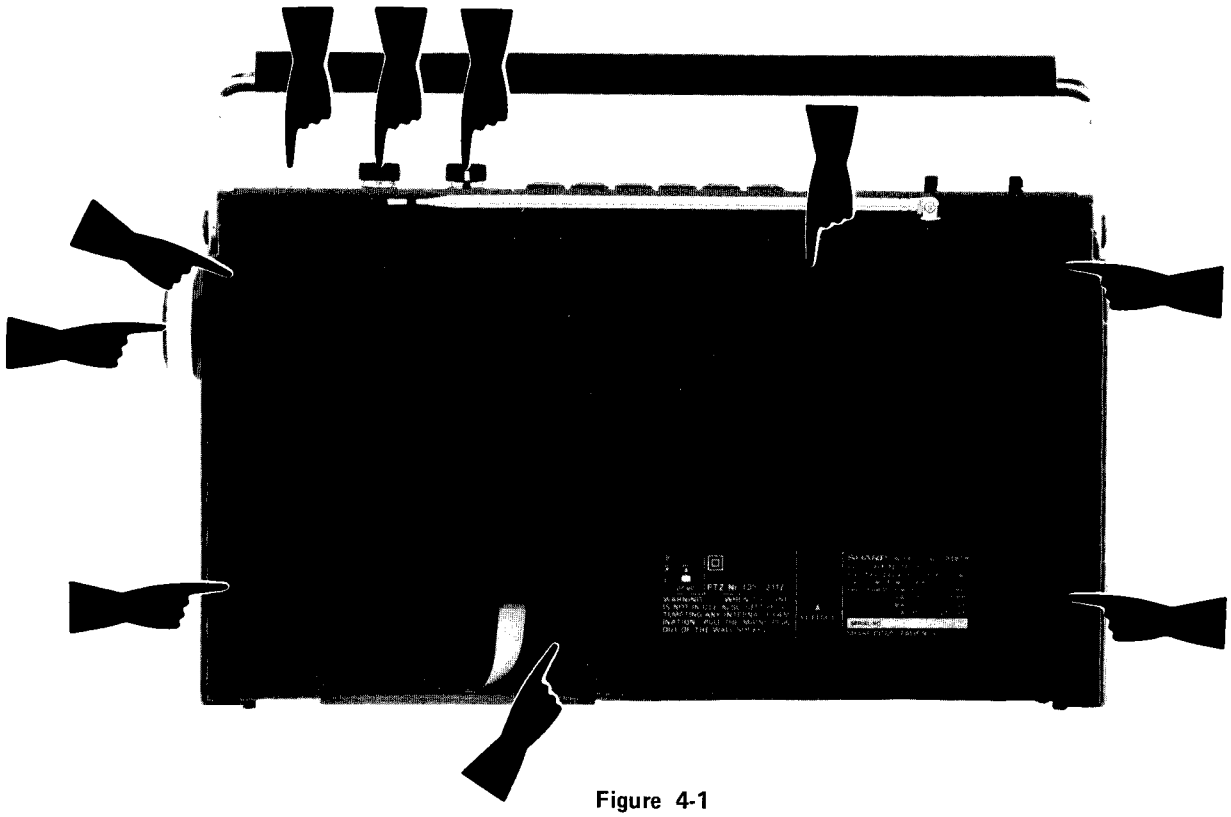


Figure 4-1

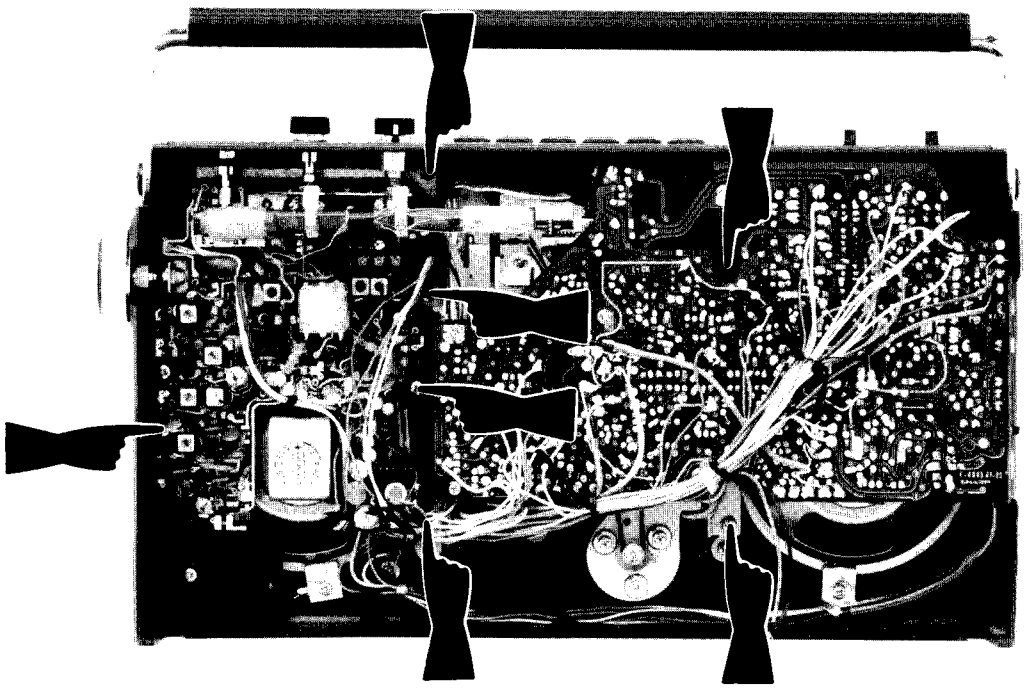


Figure 4-2

MECHANICAL ADJUSTMENT

FLYWHEEL THRUST CLEARANCE ADJUSTMENT

(Refer to Figure 5-1.)

Slowly tighten the screw for flywheel thrust clearance until the thrust clearance becomes 0 (zero) and loosen the screw by 1/4 turn from this point. Since screw's pitch is 0.8 mm (.0315 inches), thrust clearance of about 0.2 mm (.0079 inches) is obtained.

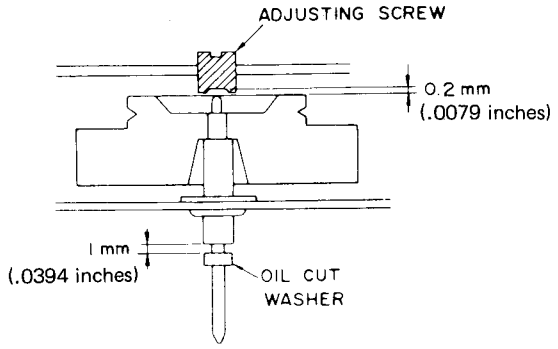
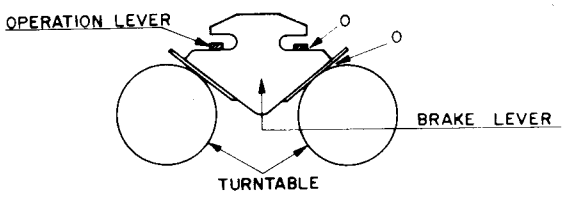


Figure 5-1

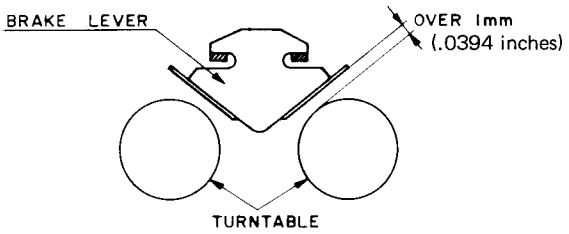
BRAKE MECHANISM ADJUSTMENT

(Refer to Figure 5-2.)

1. Check that the brake lever is pressed against both turntables in stop mode and that the brake lever is apart at the same distance from both turntables in play, fast forward and rewind modes.
2. Adjust it by bending the operation lever when the distance is abnormal.



STOP MODE



PLAY, FAST FORWARD AND REWIND MODES

Figure 5-2

PRESSURE ROLLER PRESSURE ADJUSTMENT

(Refer to Figure 5-3.)

1. Setting the unit in play mode with power supply turned on, push the point A with use of tension gauge to make the pressure roller apart from the capstan shaft. Then, gradually release the tension gauge and read its value when the pressure roller starts to rotate.
2. It is normal when the tension gauge reads 310 – 410 grams (10-15/16 oz to 14-15/32 oz).
   If the above value is not satisfied, adjust the pressure roller lever spring.

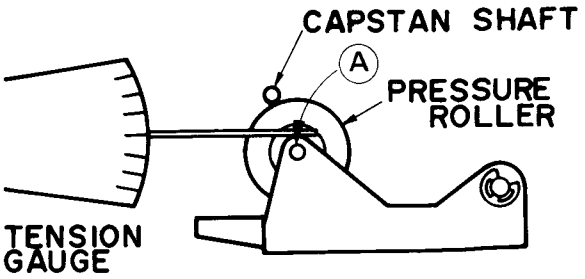


Figure 5-3

TAKE-UP PULLEY PRESSURE ADJUSTMENT

(Refer to Figure 6-1.)

1. With power supply turned on, press the play key.
2. Hook the tension gauge at the end of slip roller lever and pull the tension gauge to make the take-up pulley apart from the take-up turntable. Then gradually release the tension gauge and read its value when the take-up turntable starts to rotate.
3. It is normal when the tension gauge reads 30 grams to 60 grams (1-1/16 oz to 2-1/8 oz). If the above value is not satisfied, change the setting position of slip roller lever spring.

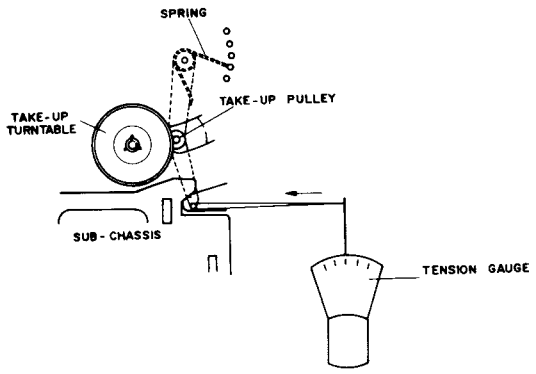


Figure 6-1

TORQUE CHECK IN PLAY MODE

(Refer to Figure 6-2.)

1. Set the torque measuring reel to the take-up turntable and hook the tension gauge at measuring point of reel.
2. Put the unit in play mode with power supply turned on.
3. Then, rotate the measuring reel in the same direction as for turntable and read the torque value when the pointer is stabilized.
4. The take-up torque should be 35 gram·cm to 60 gram·cm (3/64 oz·inch to 27/32 oz·inch).

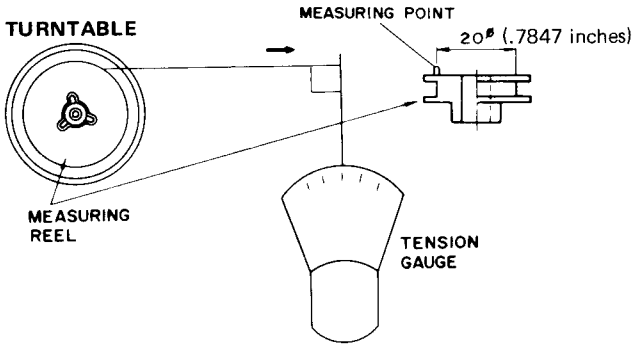


Figure 6-2

MAIN SWITCH (SW8) SETTING POSITION ADJUSTMENT

(Refer to Figure 6-3.)

Place the mechanism in stop mode and use the main switch retaining screws to adjust the position so that the clearance between the main switch (SW8) and brake connecting lever becomes 0.3 mm to 0.5 mm (.0118 inches to .0197 inches). Next place the mechanism in play mode and make sure the main switch is made turned on.

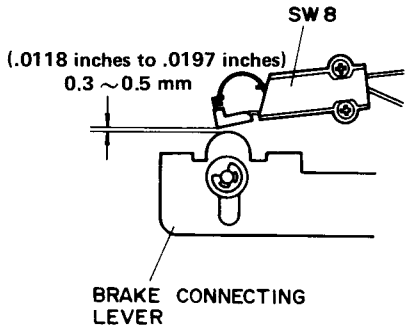


Figure 6-3

PLAYBACK SWITCH (SW11) SETTING POSITION ADJUSTMENT

(Refer to Figure 6-4.)

Place the mechanism in APSS mode (by pressing the play key and fast forward/rewind key) and use the playback switch retaining screw to adjust the position so that the clearance between the playback switch (SW11) and sub-chassis becomes 0.5 mm (.0197 inches).
Next place the mechanism in play mode and make sure the playback switch is made turned on.

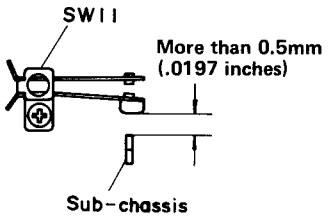


Figure 6-4

PAUSE SWITCH (SW10) SETTING POSITION ADJUSTMENT

(Refer to Figure 6-5.)

Place the mechanism in stop mode and use the pause switch retaining screw to adjust the position so that the clearance between the pause switch (SW10) and push button lever becomes 0.5 mm (.0197 inches).
Next place the mechanism in pause mode and make sure the pause switch is made turned on.

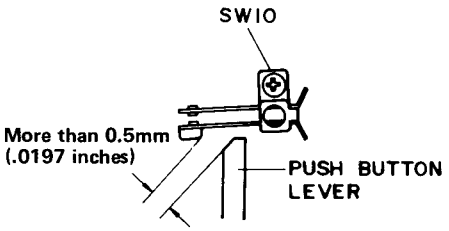


Figure 6-5

APSS SWITCH (SW9) SETTING POSITION ADJUSTMENT
(Refer to Figure 7-1.)
Place the mechanism in play mode and use the APSS switch retaining screw to adjust the position so that the clearance between the APSS switch (SW9) and APSS switch lever becomes 0.5 mm (.0197 inches).
Next place the mechanism in APSS mode and make sure the APSS switch is made turned on.

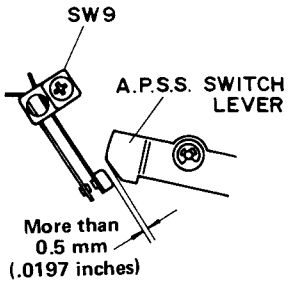


Figure 7-1

SOLENOID (SOL301) SETTING POSITION ADJUSTMENT
(Refer to Figure 7-2.)
Place the mechanism in fast forward mode (by depressing the fast forward key), push the core of solenoid and use the solenoid retaining screws to adjust the position so that the clearance between the release lever and solenoid becomes 3.6 mm (.1417 inches). After check the mechanism is normally changed to play mode from APSS mode.
Next make sure the mechanism is changed to stop mode by the solenoid from play, fast forward or rewind mode when the tape comes to the end.

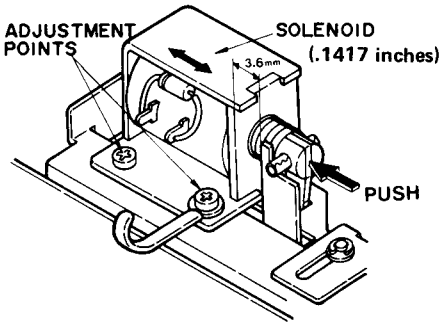


Figure 7-2

ELECTRICAL MEASUREMENT

* This unit operaters on DC 9V. Check that the power supply is exactly 9V before measurement.
* Set the function selector switch (SW3) to "TAPE" position.

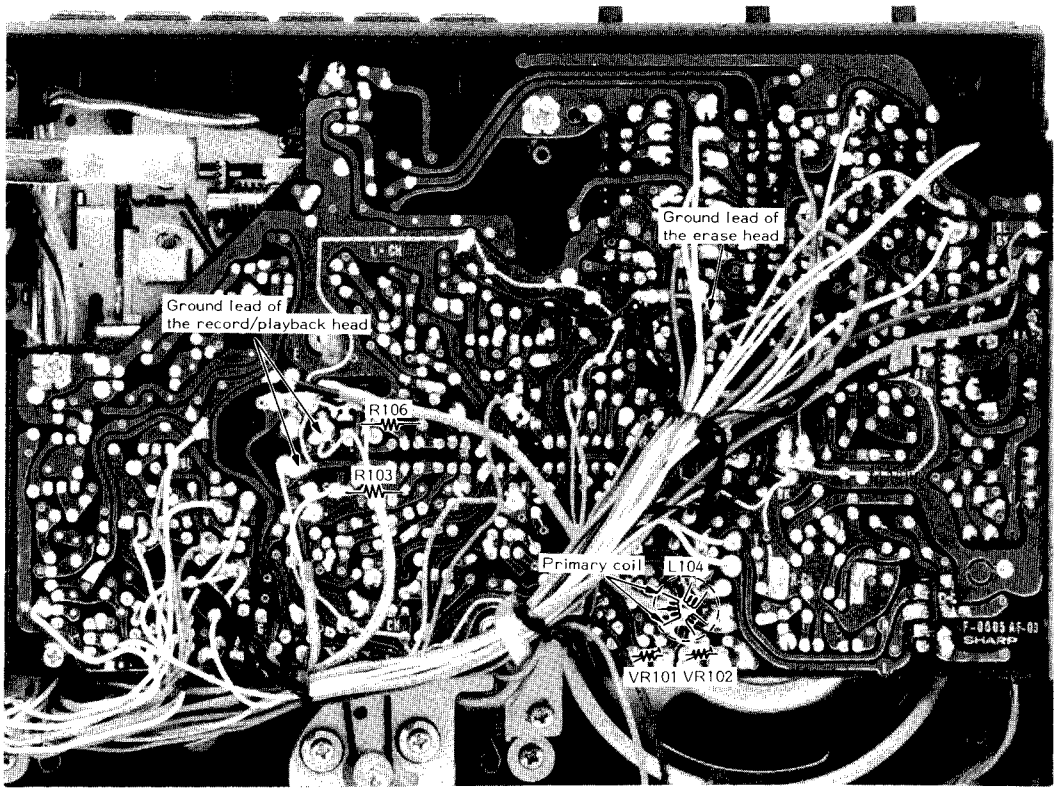


Figure 7-3

RECORD OSCILLATOR BIAS FREQUENCY AND BIAS CURRENT ADJUSTMENT
(Refer to Figure 8-1.)

1. Place the unit in record mode.
2. Set the beat canceller switch (SW12) to 'A' position.
3. Connect the VTVM across the 100 ohm resistor (R103, R106).
4. Rotate the variable resistor (VR101) to the position where the resistance value becomes the minimum.
5. Adjust the variable resistor (VR102) so that the VTVM reads the same value for the right channel (R106) and left channel (R103).
6. Adjust the variable resistor (VR101) so that the VTVM reads 54 mV for the right channel (R106) and left channel (R103) respectively.
7. Make sure the record oscillator bias frequency is 53 ± 3 kHz.

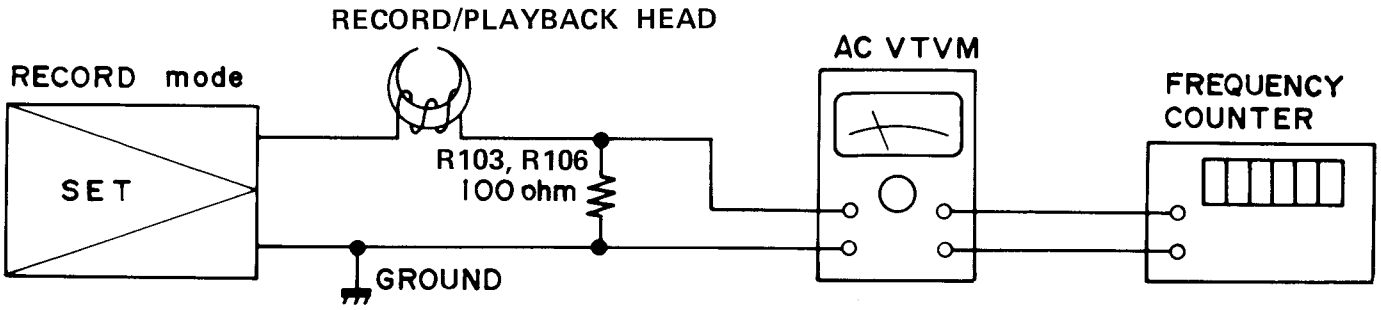


Figure 8-1

RECORD SENSITIVITY CHECK
(Refer to Figure 8-2.)

1. Place the unit in record mode.
2. Connect the VTVM across the 100 ohm resistor (R103, R106).
3. Short circuit the primary coil of the Oscillator coil (L104) to stop bias oscillation.
4. Connect the audio signal generator for 1,000 Hz, −78 dB (0.126mV) to the external microphone jacks (J1A, J1B).
5. If the record amplifier sensitivity is normal, the reading on VTVM should be approximately 1.75 mV.

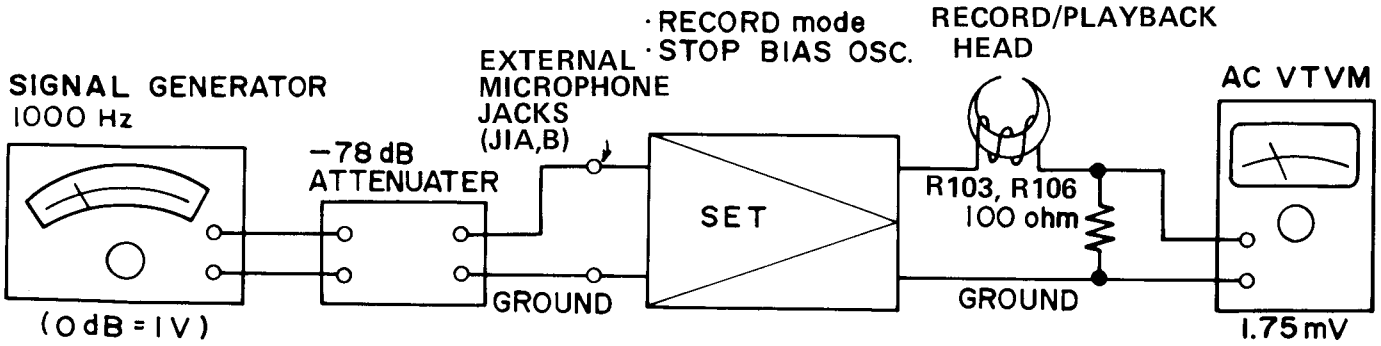


Figure 8-2

PLAYBACK AMPLIFIER SENSITIVITY CHECK
(Refer to Figure 9-1.)

1. Place the unit in play mode with the volume controls (VR201A, VR201B) at maximum.
2. Rotate the tone control (VR202A, VR202B) to "HIGH" position.
3. Connect the VTVM to the headphones jack (J1C).
4. Connect the audio signal generator for 1,000 Hz, −80 dB (0.1mV) across the ground lead (Red) of the Record/Playback Head.
5. If the playback amplifier sensitivity is normal, the reading on the VTVM should be approximately 1 V.

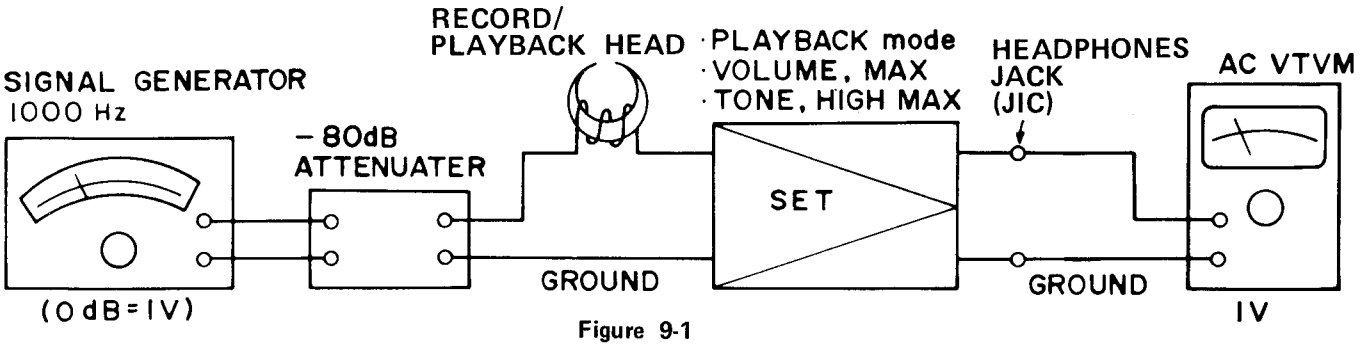


Figure 9-1

ERASE CURRENT CHECK
(Refer to Figure 9-2.)

1. Place the unit in record mode.
2. Connect the DC Ammeter to the ground lead of the erase head. If the erase current is normal, the Ammeter should be show 9 – 13 mA.

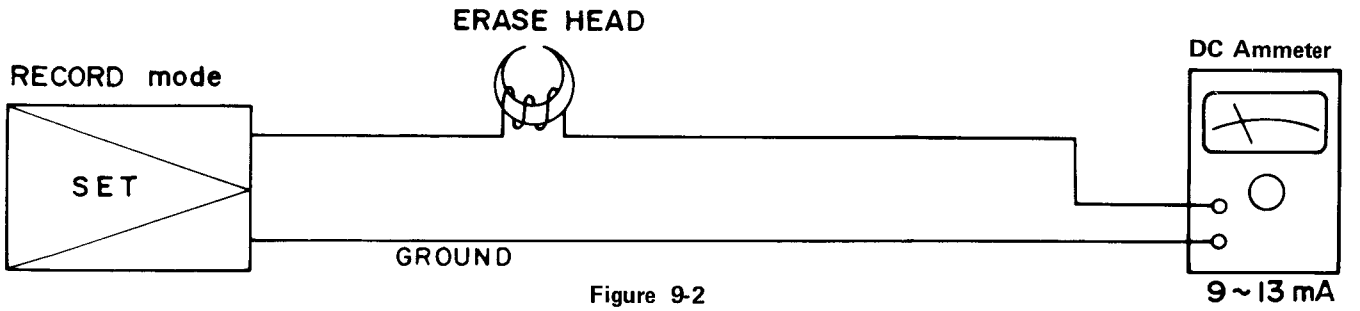


Figure 9-2

RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENT
(Refer to Figure 9-3.)

1. Insert the test tape (MTT-114, 10 kHz Recorded).
2. Set mode selector switch (SW5) in the STEREO position.
3. Place the unit in play mode with the volume controls (VR201A, VR201B) at maximum.
4. Rotate the tone control (VR202A, VR202B) to 'HIGH' position.
5. Connect the VTVM to the headphones jack (J1C).
6. Adjust the head azimuth adjusting screw so that the playback output voltage of the test tape becomes maximum in the sides and the phase between channels gets same.

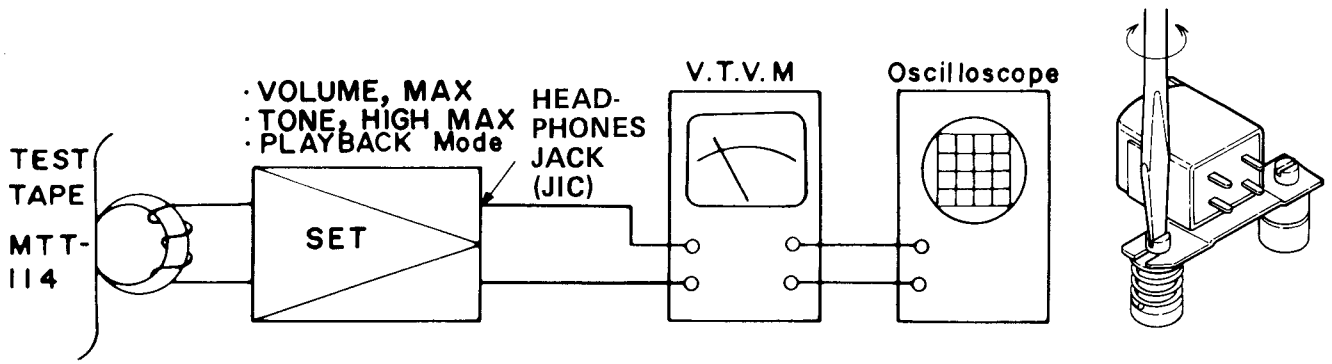


Figure 9-3

GENERAL ALIGNMENT INSTRUCTION

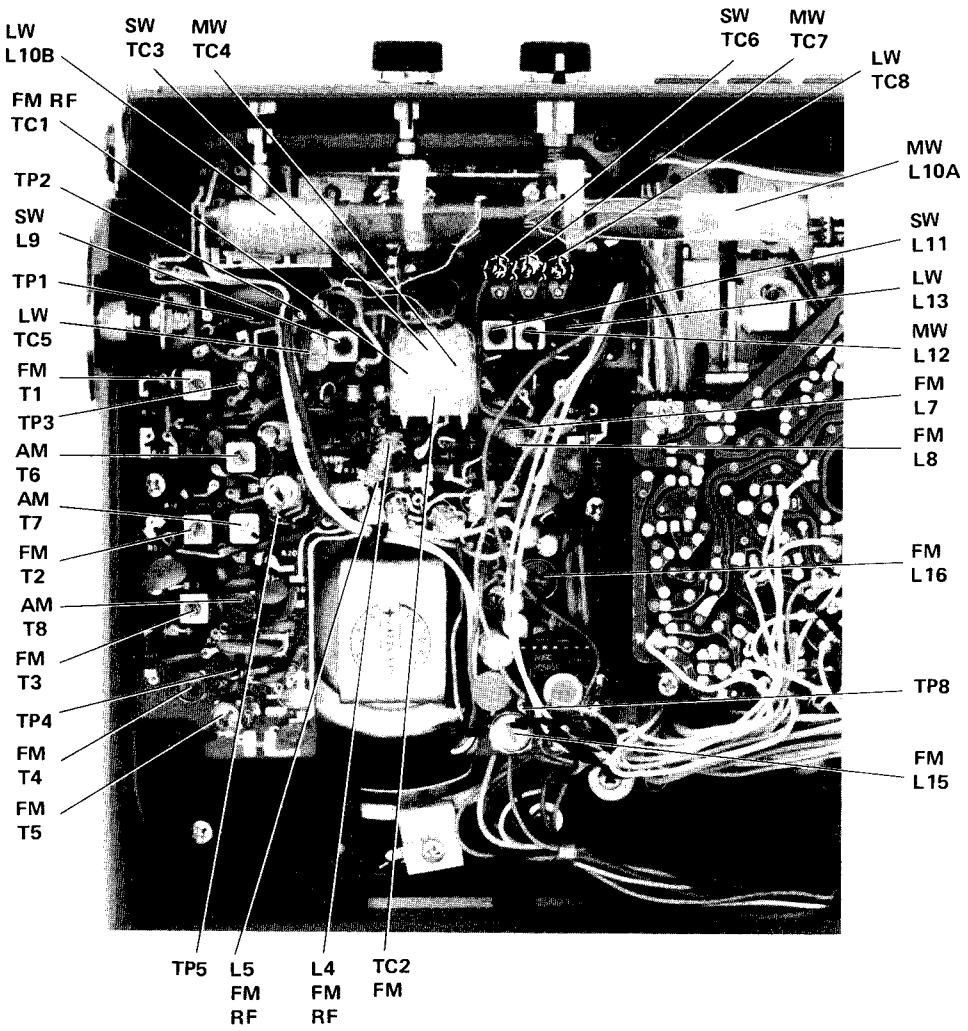


Figure 10-1

Should it become necessary at any time to check the alignment of this receiver, proceed as follows;

1. Connect an output meter across the speaker voice coil lugs.
2. Set the volume control to maximum.
3. Attenuate the signals from the generator enough to swing the most sensitive range of the output meter.
4. Use a non-metallic alignment tool.
5. Repeat adjustments to insure good results.
6. Set the function selector switch (SW3-A ~ H) to 'RADIO' position.

AM IF ALIGNMENT CHART (MW, LW, SW)

Set the band selector switch (SW1-A ~ J) to 'MW' position.

STEP	TEST STAGE	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
		CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	IF	Connect signal generator through a 10K ohm resistor to the antenna tuning capacitor (VC3). Ground lead to the receiver chassis.	Exactly 455kHz. (400Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Adjust for maximum output on speaker voice coil lugs.	T6 (Yellow) T7 (White) T8 (Black)
		Repeat until no further improvement can be made.				

AM RF ALIGNMENT CHART (MW, LW, SW)

STEP	BAND	TEST STAGE	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
			CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	MW	Band Coverage	Use radiating loop. Loop of several turns of wire, or place generator lead close to receiver for adequate signal pickup. Connect generator output to one end of this wire.	Exactly 510kHz. (400Hz, 30%, AM modulated)	Low end of dial. (maximum capacity)	Adjust for maximum output on speaker voice coil lugs.	Adjust the MW oscillator coil (L12).
2	MW		Same as step 1.	Exactly 1650kHz. (400Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Same as step 1.	Adjust the MW oscillator trimmer (TC7).
3	MW	Tracking	Same as step 1.	Exactly 600kHz. (400Hz, 30%, AM modulated)	600kHz.	Same as step 1.	Adjust the MW antenna coil (L10A). (See NOTE A)
4	MW		Same as step 1.	Exactly 1400kHz. (400Hz, 30%, AM modulated)	1400kHz.	Same as step 1.	Adjust the MW antenna trimmer (TC4).
5	MW	Repeat steps 1, 2, 3 and 4 until no further improvement can be made.					
6	LW	Band Coverage	Same as step 1.	Exactly 145kHz. (400Hz, 30%, AM modulated)	Low end of dial. (maximum capacity)	Same as step 1.	Adjust the LW oscillator coil (L13).
7	LW		Same as step 1.	Exactly 295kHz. (400Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Same as step 1.	Adjust the LW oscillator trimmer (TC8).
8	LW	Tracking	Same as step 1.	Exactly 160kHz. (400Hz, 30%, AM modulated)	160kHz.	Same as step 1.	Adjust the LW antenna coil (L10B).
9	LW		Same as step 1.	Exactly 260kHz. (400Hz, 30%, AM modulated)	260kHz.	Same as step 1.	Adjust the LW antenna trimmer (TC5).
10	LW	Repeat steps 6, 7, 8 and 9 until no further improvement can be made.					
11	SW	Band Coverage	Connect signal generator through a dummy (10PF capacitor and 30 ohms resistor) to test point TP1. Connect generator ground lead to test point TP2.	Exactly 5.85MHz. (400Hz, 30%, AM modulated)	Low end of dial. (maximum capacity)	Same as step 1.	Adjust the SW oscillator coil (L11).
12	SW		Same as step 11.	Exactly 18.5MHz. (400Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Same as step 11.	Adjust the SW oscillator trimmer (TC6).
13	SW	Tracking	Same as step 11.	Exactly 6.5MHz. (400Hz, 30%, AM modulated)	6.5MHz.	Same as step 11.	Adjust the SW antenna coil (L9). (See NOTE A)
14	SW		Same as step 11.	Exactly 16MHz. (400Hz, 30%, AM modulated)	16MHz.	Same as step 11.	Adjust the SW antenna trimmer (TC3).
15	SW	Repeat steps 11, 12, 13 and 14 until no further improvement can be made.					

NOTE A

Check the alignment of the receiver antenna coil by bringing a piece of ferrite (such as a coil slug) near the antenna loop stick, then a piece of brass. If ferrite increases output, loop requires more inductance. If brass increases output, loop requires less inductance. Change loop inductance by sliding the bobbin toward the center of ferrite core to increase inductance, or away to decrease inductance.

FM ALIGNMENT CHART

Set the band selector switch (SW1-A ~ J) to 'FM' position

STEP	TEST STAGE	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
		CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	IF	Connect signal generator through a 5PF capacitor to test point TP-3. Connect generator ground lead to the point TP-2	Exactly 10.7MHz. (400Hz, 30%, AM modulated)	High end of dial. (minimum capacity)	Connect VTVM (AC) between test point TP-4 and chassis ground.	Detune T5 (Orange). Tune T1 (Violet), T2 (Violet), T3 (Violet) and T4 (Green) for maximum indication.
2	Ratio Detector	Same as step 1.	Exactly 10.7MHz. (Unmodulated)	Same as step 1.	See NOTE B.	See NOTE B.
3	Band Coverage	Connect signal generator through a dummy, including output impedance of signal generator to the FM antenna TP-1. (Refer to Figure 24) Ground lead of generator connected to the receiver chassis TP-2.	Exactly 87.1MHz. (400Hz, 30%, FM modulated)	Low end of dial. (maximum capacity)	Adjust for maximum output speaker voice coil lugs.	Adjust the FM oscillator coil (L7, L8)
4		Same as step 3.	Exactly 109MHz. (400Hz, 30%, FM modulated)	High end of dial. (minimum capacity)	Same as step 3.	Adjust the FM oscillator trimmer (TC2).
5	Tracking	Same as step 3.	Exactly 88MHz. (400Hz, 30%, FM modulated)	88MHz	Same as step 3.	Adjust the FM RF coil (L4, L5).
6		Same as step 3.	Exactly 108MHz. (400Hz, 30%, FM modulated)	108MHz	Same as step 3.	Adjust the FM RF trimmer (TC1).
7		Repeat steps 3, 4, 5 and 6 until no further improvement can be made.				

NOTE B

1. Connect VTVM (0.1 volts range DC scale) between test point TP4 and chassis ground.
2. Adjust T5 (Orange) for 0 volts reading on VTVM.
3. Change signal generator frequency 10.7MHz + 100kHz and – 100kHz approximately.
4. Adjust T4 (Green) for balanced peaks.

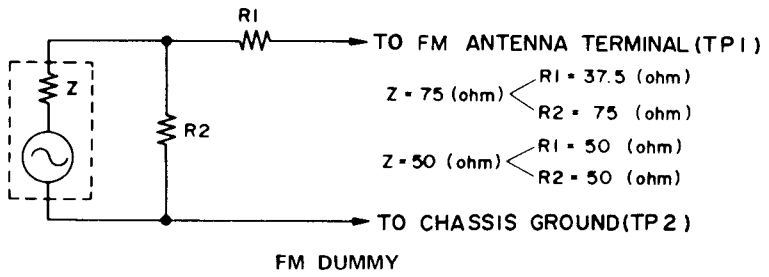


Figure 12-1

FM MPX ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RECEIVER		ADJUSTMENT
	CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	Connect signal generator through a dummy, including output impedance of signal generator to the FM antenna [TP 1] (Refer to Figure 12-1) Ground lead of generator connected to the receiver chassis [TP 2] .	Exactly 98MHz (500μV/m). 19kHz, 10%, Frequency modulation. (Pilot signal only)	98MHz	Connect oscilloscope through a 470k ohm resistor to test point [TP 8] Ground lead of oscilloscope connected to the receiver chassis [TP 9]	Adjust the MPX coil (L15) for maximum indication.
2	Same as step 1.	Exactly 98MHz (500μV/m). 6kHz Frequency modulation. Right Channel only.	98MHz	Adjust for minimum output speaker voice coil lugs. (Channel Left)	Adjust the MPX coil (L16).
3	Same as step 1.	Exactly 98MHz (500μV/m). 6kHz Frequency modulation. Left Channel only.	98MHz	Adjust for minimum output speaker voice coil lugs. (Channel Right)	Same as step 2.
4	Repeat steps 2 and 3 until no further improvement can be made.				

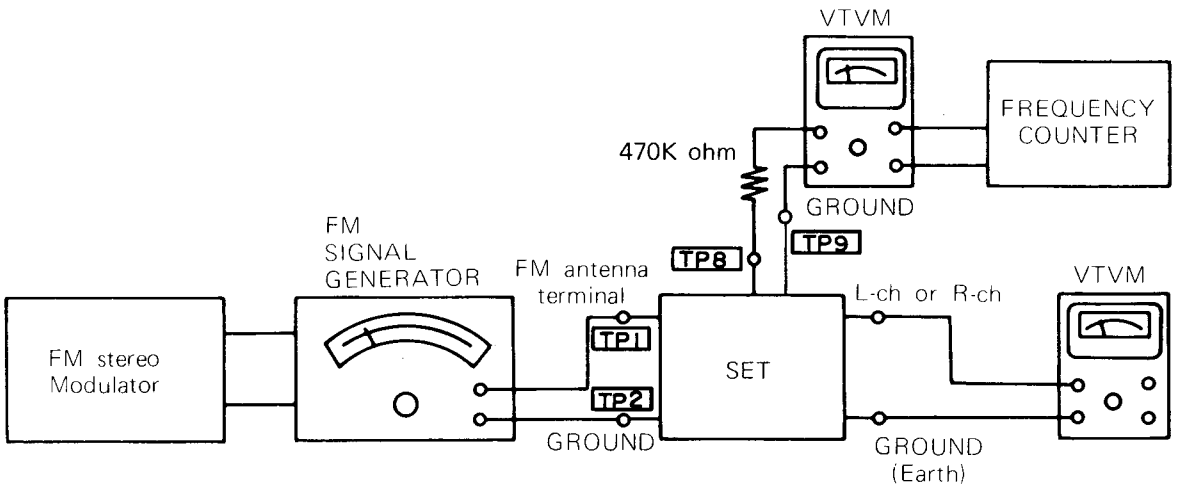


Figure 13-1 FM STEREO ALIGNMENT EQUIPMENT CONNECTIONS

CIRCUIT DESCRIPTION OF APSS

APSS is an abbreviation of Auto Program Search System uniquely developed by SHARP, which can automatically detect the starting position of each program.
With the APSS system, if the fast forward button or rewind button is depressed during playback mode, the tape is fast forwarded to the starting position of the next program (the end position of the previous program) and then the fast forward button or rewind button is automatically released to make the mechanism be put in play mode.

OUTLINE OF APSS

MIXER AMP.
This amplifier consists of Q105 and serves to mix equalizer amplifier outputs of right and left channels.

LIMITER AMP.
This amplifier is composed of Q301 and Q302 and serves to amplify the output of mixer amplifier to the level where the APSS starts to operation.

VOLTAGE DOUBLING RECTIFIER CIRCUIT
This voltage doubling rectifier circuit is composed of D301 and D302.

TIME CONSTANT CIRCUIT
This time constant circuit is composed of R308 and C304.

LEVEL COMPARISON CIRCUIT
This level comparison circuit is composed of Q303 and Q304. With this level comparison circuit of which the function is based on switching characteristic of transistors, the rectifying voltage, which has been produced by the voltage doubling rectifier circuit and time constant circuit, is used to be input to the base of Q303.

PLUNGER CONTROLLED CIRCUIT
This plunger controlled circuit is composed of Q305 and Q307 The Q305 is a differential circuit to utilize the signal coming from the level comparison circuit to initiate the plunger only at the breaking time.
The Q307 uses the signal coming from the differential circuit to cause switching of the plunger.

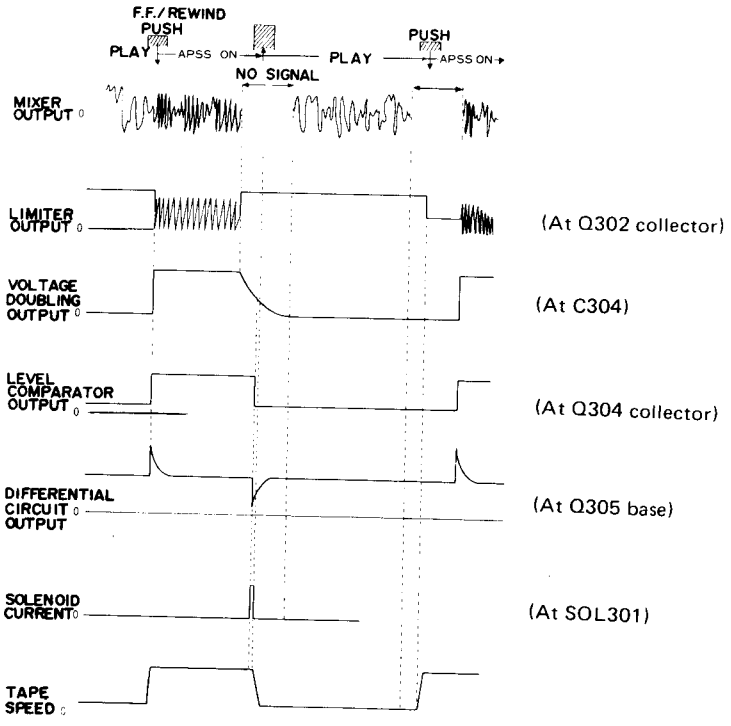


Figure 14-1

FUNCTION OF APSS

The following are detailed functions of the system. During play mode, signals amplified by the transistors (Q101, Q102, Q103, Q104) enter the mixer amplifier (Q105). The outputs of Q105 is amplified and limited by the transistors (Q301, Q302) and the outputs of Q302 is rectified by the diodes (D301 and D302).
The output of D301 is level compared by the transistors (Q303 and Q304) and current runs in the base of Q305, turning on. With Q305 turned on, the current runs in the base of Q307.
At this time, current runs in the plunger to make it be attracted and the mechanism is changed to play mode from APSS mode.

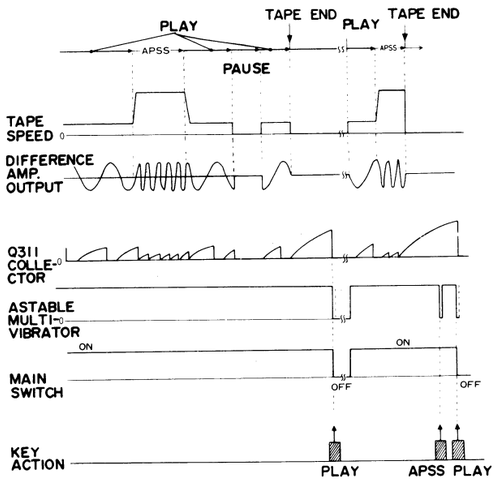


Figure 15-1

FUNCTIONS OF AUTO STOP SYSTEM

Auto stop mechanism adopted for this unit depends upon the combination of the magnet located at the counter shaft and hall element to detect variations of the related magnetic field. If the magnet attached to the counter shaft rotates (in play mode, fast forward mode, rewind mode, record mode or APSS mode), the Hall element is due to detect variations of the magnetic field and related signal is output from the difference amplifier consisting of Q309 and Q310. The signal coming from the differential amplifier is applied to the base of Q311 and then saw tooth wave-like signal is output from the collector of Q311. When, contrary to the above, the magnet fixed to the counter shaft stops to rotate, no variations of the magnetic field is caused for the Hall element. Then the collector voltage of Q311 increases and the astable multivibrator composed of Q312 and Q313 starts to function. And the output signal of the emitter of Q313 is applied to the base of Q307, causing current to run in the plunger to make it be attracted. Thus the mechanism is changed to stop mode from play mode, fast forward mode, rewind mode, record mode or APSS mode.

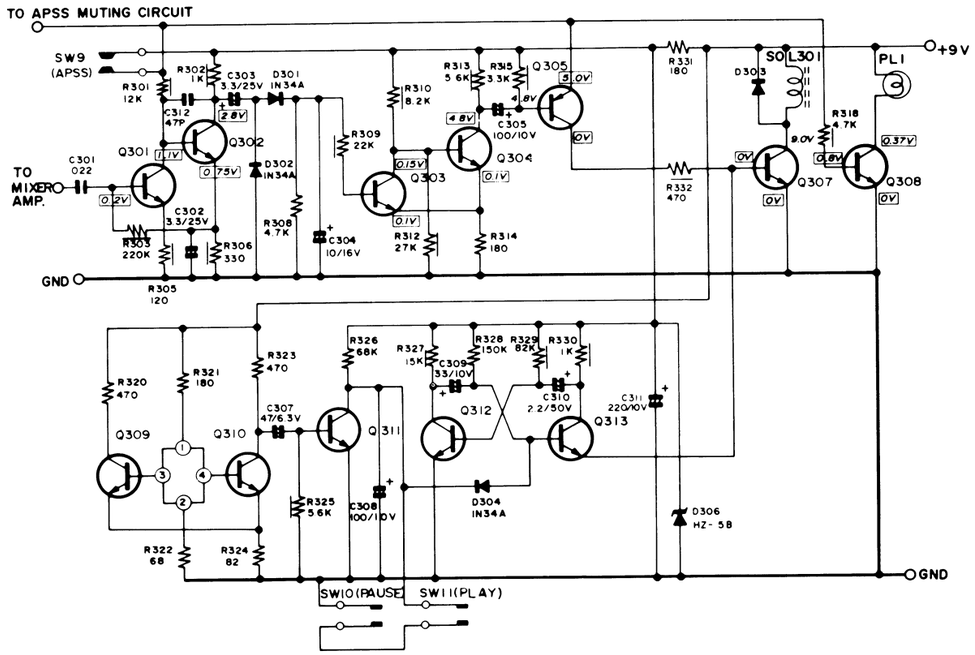


Figure 15-2

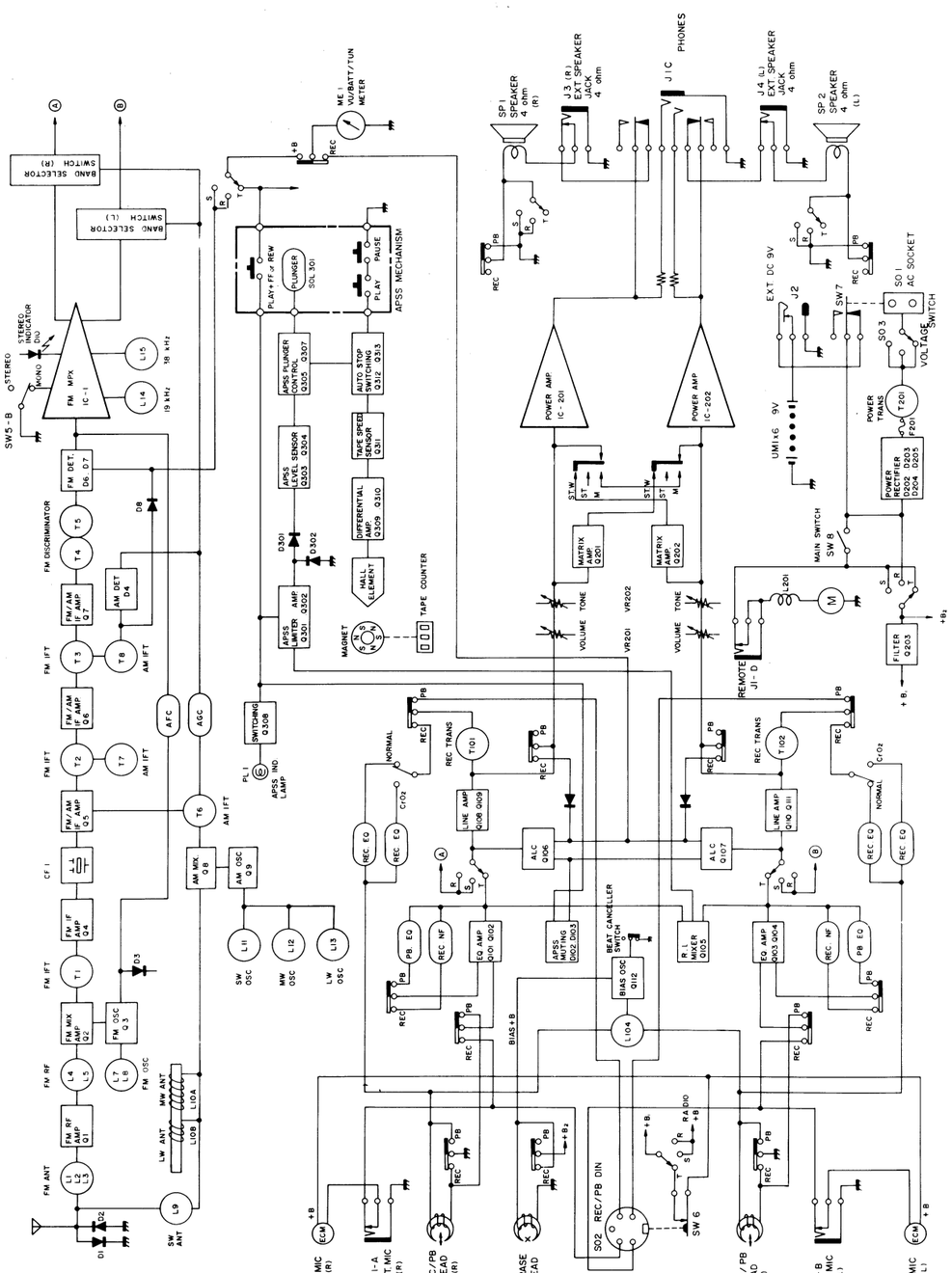
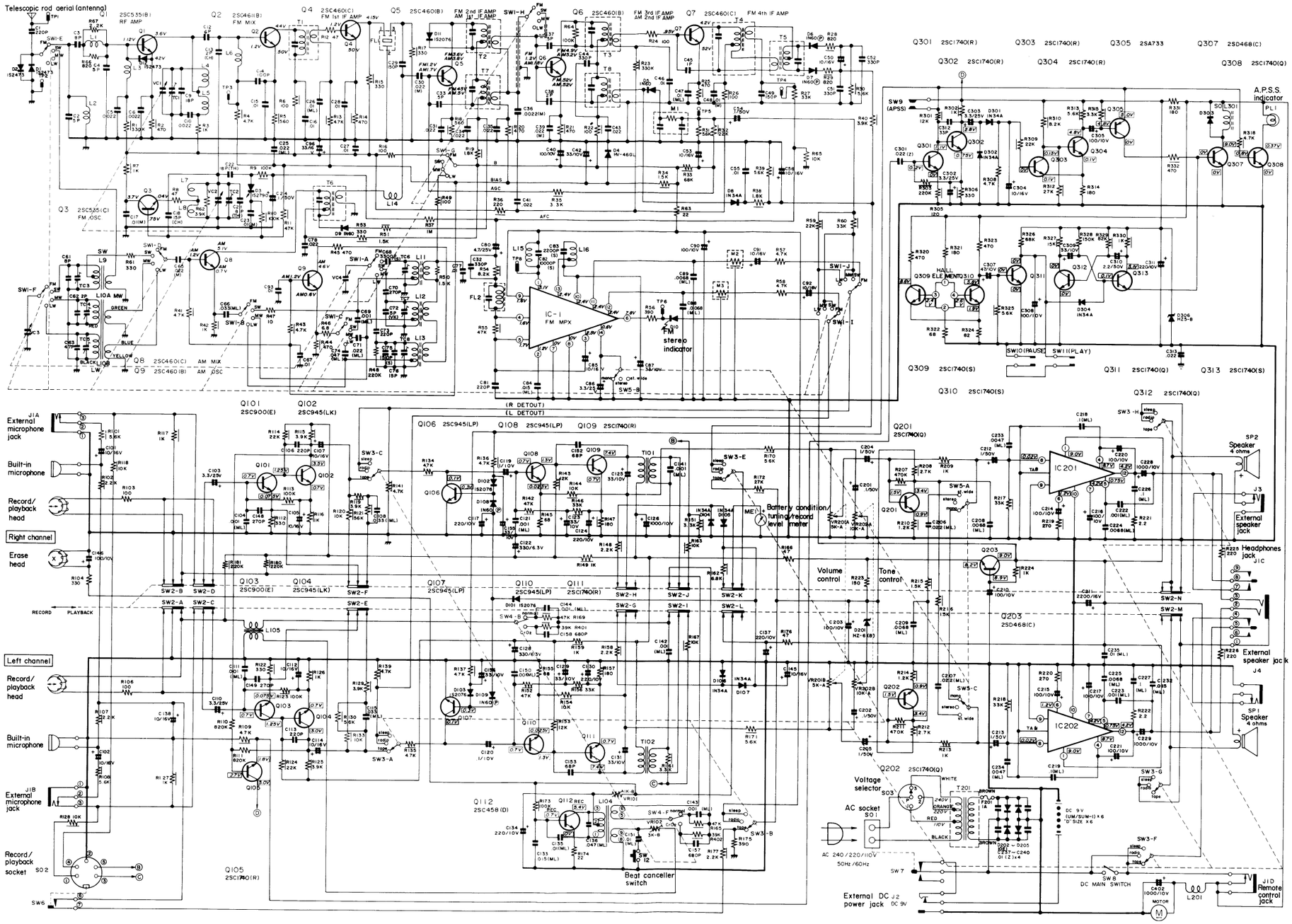


Figure 16 BLOCK DIAGRAM



NOTES

1. SW1 (A ~ J): Band selector switch. (Shown in FM position.)
2. SW2 (A ~ N): Record/Playback switch. (Shown in play mode.)
3. SW3 (A ~ H): Function selector switch. (Shown in tape position.)
4. SW4 (B, F): Tape selector switch. (Shown in normal position.)
5. SW5 (A ~ C): Mode selector switch. (Shown in mono position.)
6. SW6: Built-in microphone switch.
7. SW7: AC/DC selector switch.
8. SW8: Mains switch.
9. SW9: APSS interlocking switch.
10. SW10: Pause interlocking switch.
11. SW11: Playback interlocking switch.
12. SW12: Beat canceller switch.
13. Unless otherwise specified. all resistance in ohms. K=1,000 ohms
14. Unless otherwise specified. all capacitance in microfarads. P=micro-micro farads.
15. The indicated voltage in each section is the one measured by V.T.V.M. between such a section and the chassis with no signal being given.
16. Frequency range: LW 150 ~ 285kHz
    MW 520 ~ 1620kHz
    SW 5.95~ 18MHz
    FM 87.6 ~ 108MHz
17. IF: MW/LW/SW 455kHz, FM 10.7MHz

(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

Figure 17 SCHEMATIC DIAGRAM

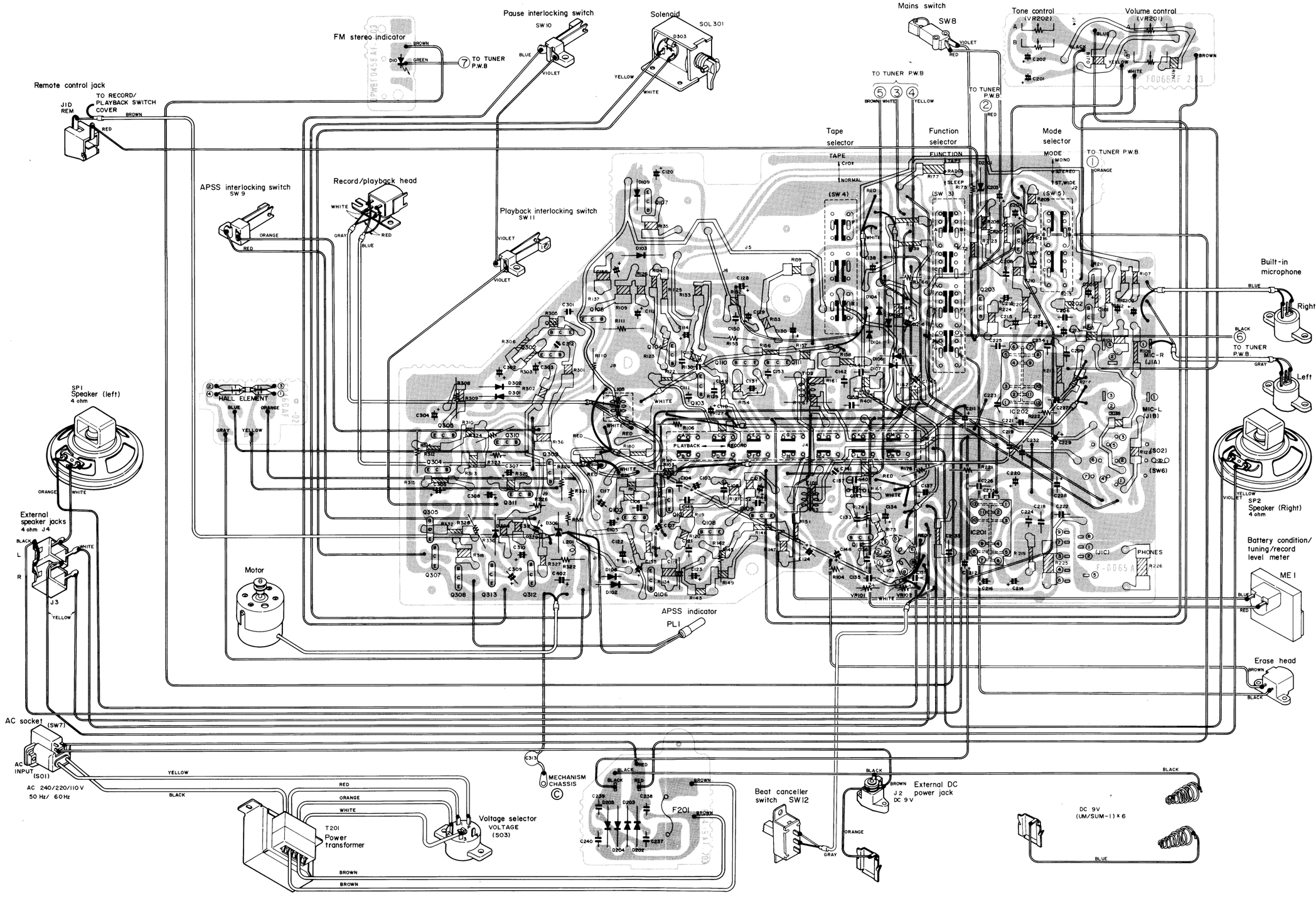


Figure 19 WIRING SIDE OF AUDIO PRINTED WIRING BOARD

	Q101, Q103	Q102, Q104	Q105	Q106, Q107	Q108, Q110	Q109, Q111	Q201, Q202
Emitter	0.075V	0.7V	1.8V	0V	0.023V	0.7V	0.9V
Collector	1.25V	3.5V	5.0V	0V	1.3V	7.4V	3.4V
Base	0.7V	1.25V	2.7V	0.3V	0.7V	1.3V	1.5V

	Q203	Q112	Q301	Q302	Q303	Q304	Q305
Emitter	8.2V	0V (Record mode)	0V	0.75V	0.1V	0.1V	5.0V
Collector	9.0V	5.4V (Record mode)	1.1V	2.8V	0.13V	4.8V	0V
Base	8.9V	0.7V (Record mode)	0.2V	1.1V	0V	0.13V	4.8V

	Q307	Q308	Q309	Q310	Q311	Q312	Q313
Emitter	0V	0V	1.8V	1.9V	0V	0V	0V
Collector	9.0V	0.37V	8.6V	5.8V	0V	0V	5.1V
Base	0V	0.8V	2.4V	2.6V	0V	0.6V	0.1V

	1	2	3	4	5	6	7	8	9	10	11	12
IC201, IC202	9.0V	–	–	8.7V	0.75V	1.2V	4.2V	0.02V	0V	0V	–	4.2V

Note: ICs and Transistors voltage shown in play mode.

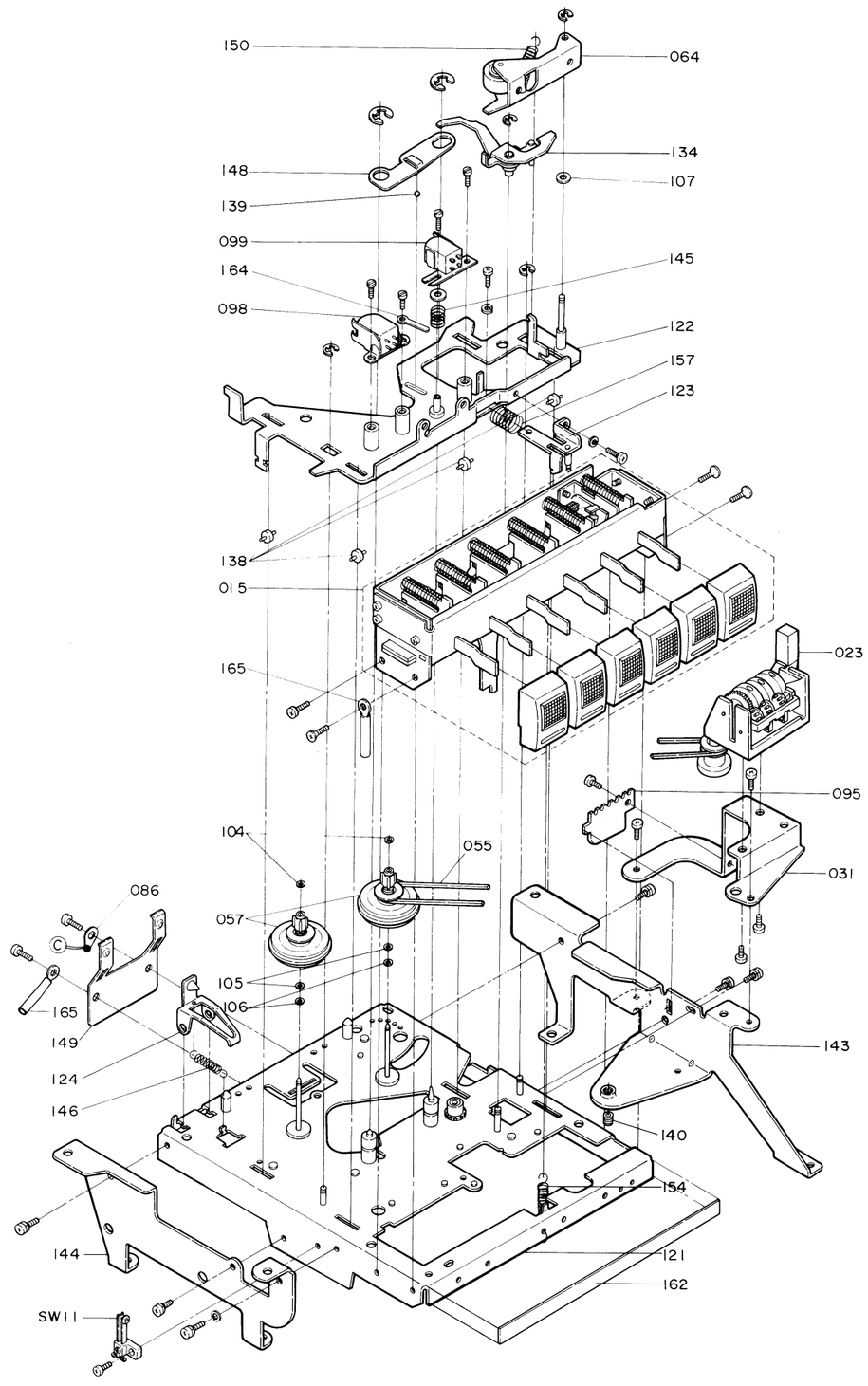
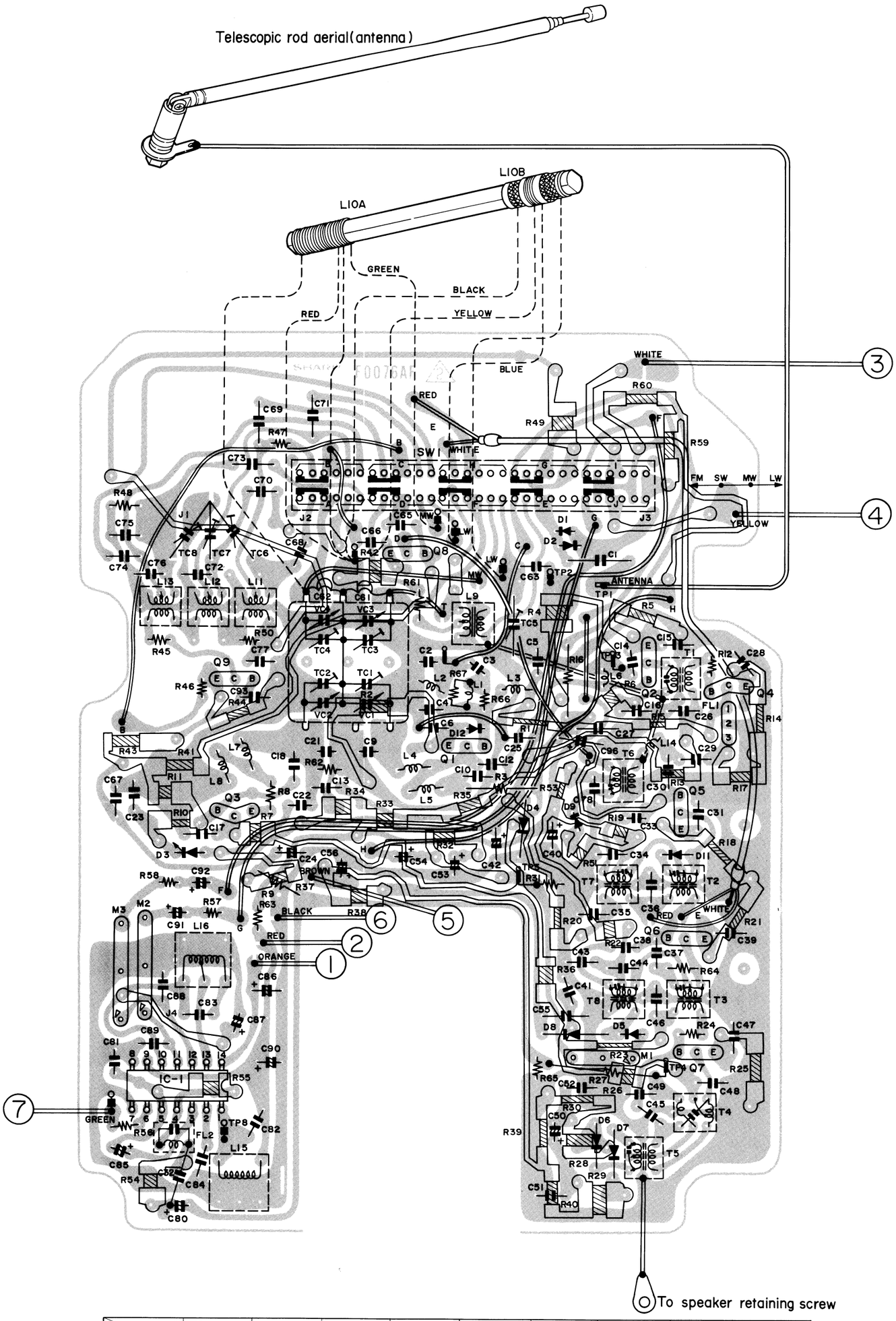


Figure 22 MECHANISM EXPLODED TOP VIEW



	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Emitter	0.42V	0.5V	0.04V	0.5V	0.45V (FM mode)	0.52V (FM mode)	0.52V	0.7V (AM mode)	0.6V (AM mode)
Collector	3.6V	4.4V	3.7V	4.15V	3.6V (FM mode)	4.9V (FM mode)	4.2V	5.1V (AM mode)	4.6V (AM mode)
Base	1.12V	1.2V	0.75V	1.2V	1.2V (FM mode)	1.2V (FM mode)	0.95V	1.2V (AM mode)	1.2V (AM mode)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC1	5.1V	1.2V	2.5V	1.6V	1.7V	7.8V	0V	0V	1.6V	2.4V	2.4V	2.4V	2.4V	0.6V

Figure 23 WIRING SIDE OF TUNER PRINTED WIRING BOARD

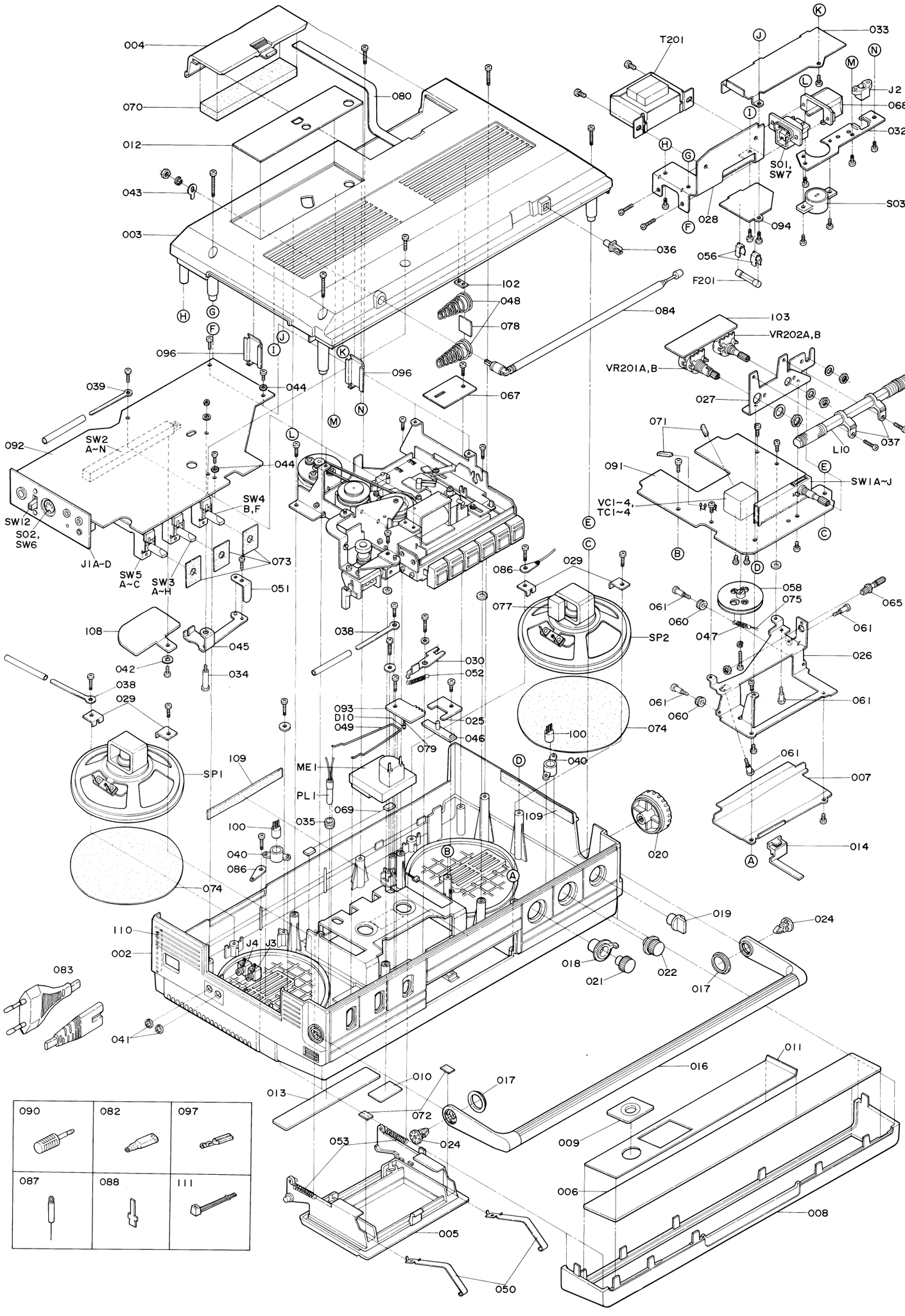


Figure 25 CABINET EXPLODED VIEW

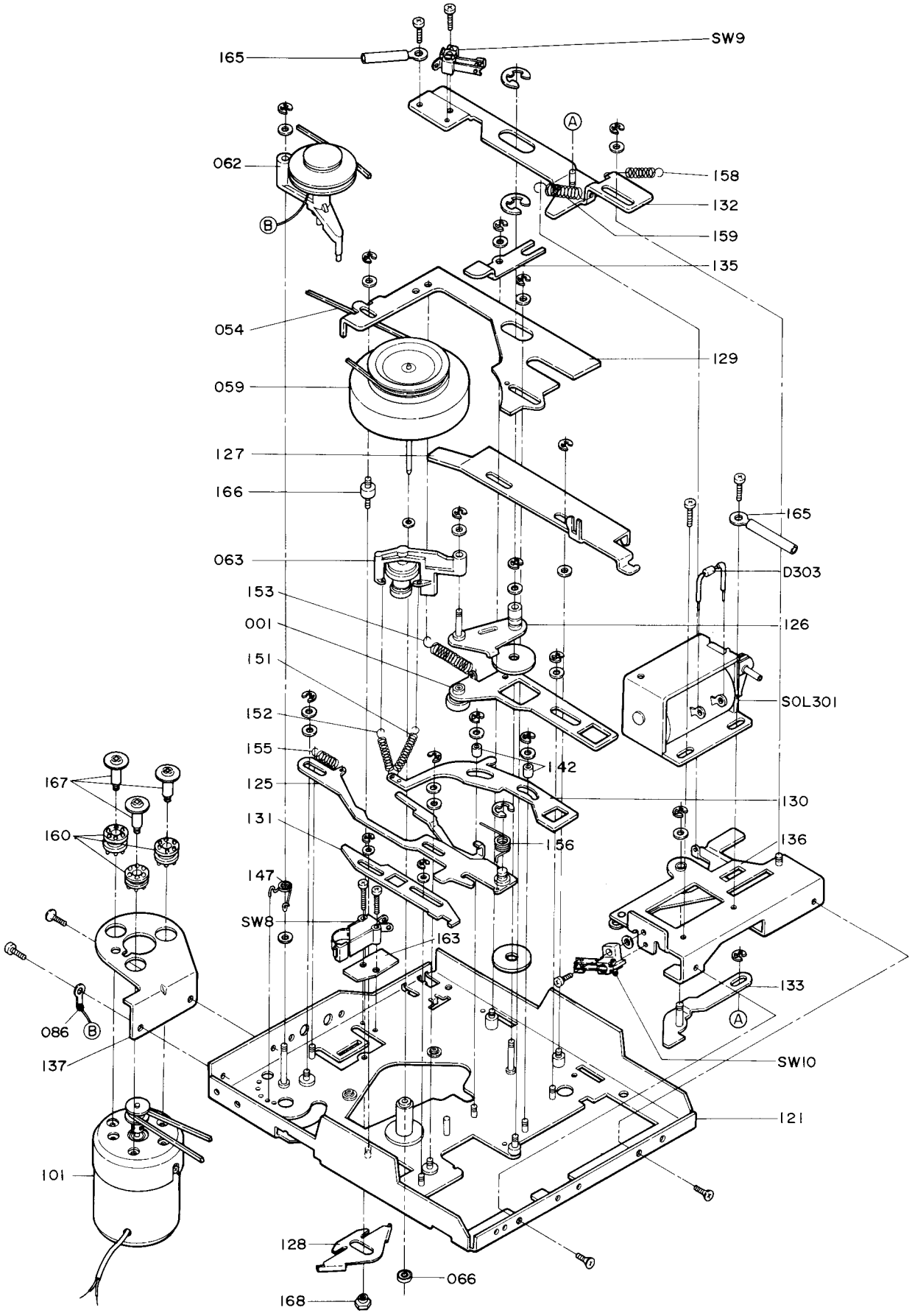
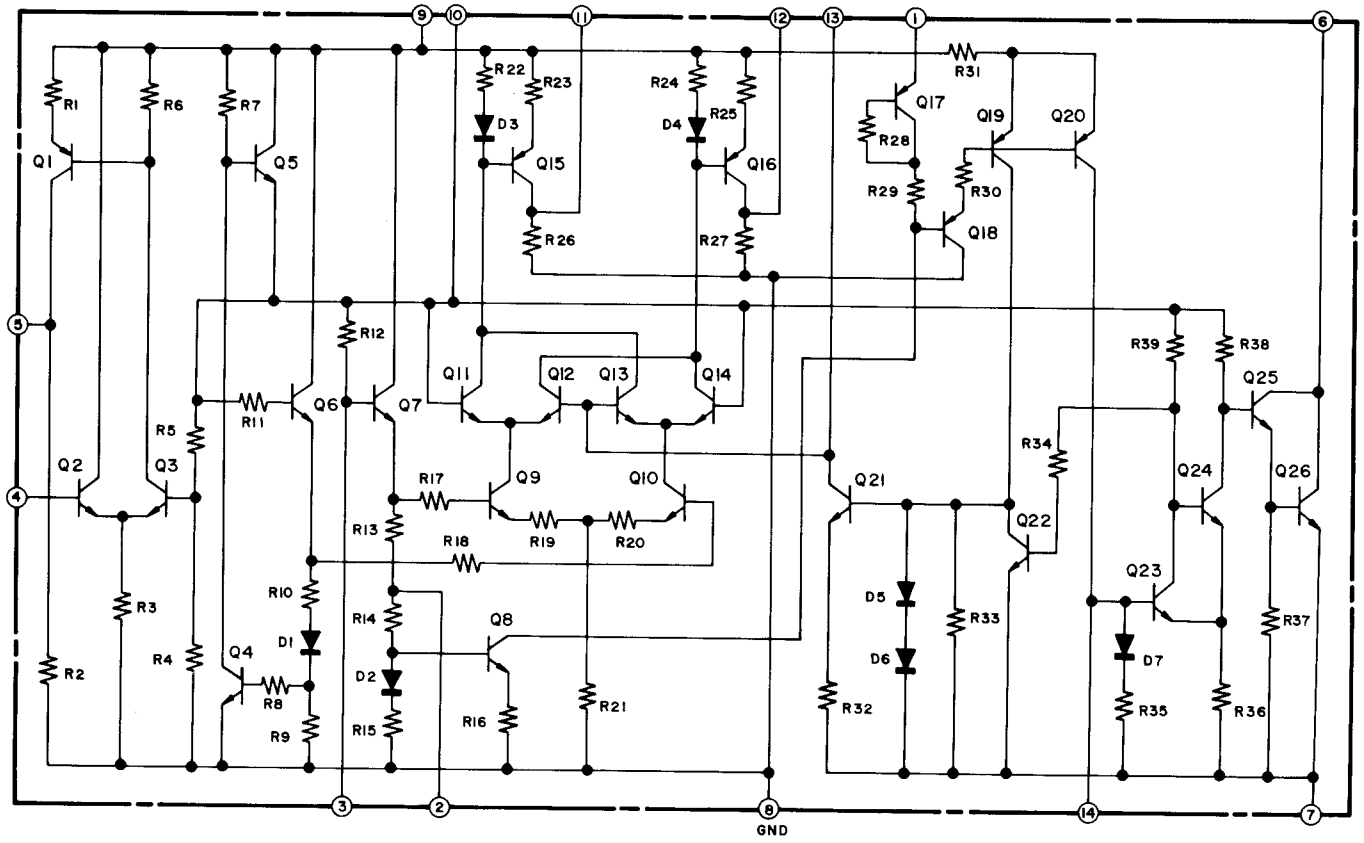


Figure 27 MECHANISM EXPLODED BOTTOM VIEW

IC1 RH-IX1021AFZZ



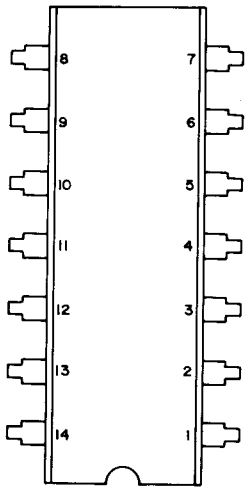


Figure 28 EQUIVALENT CIRCUIT

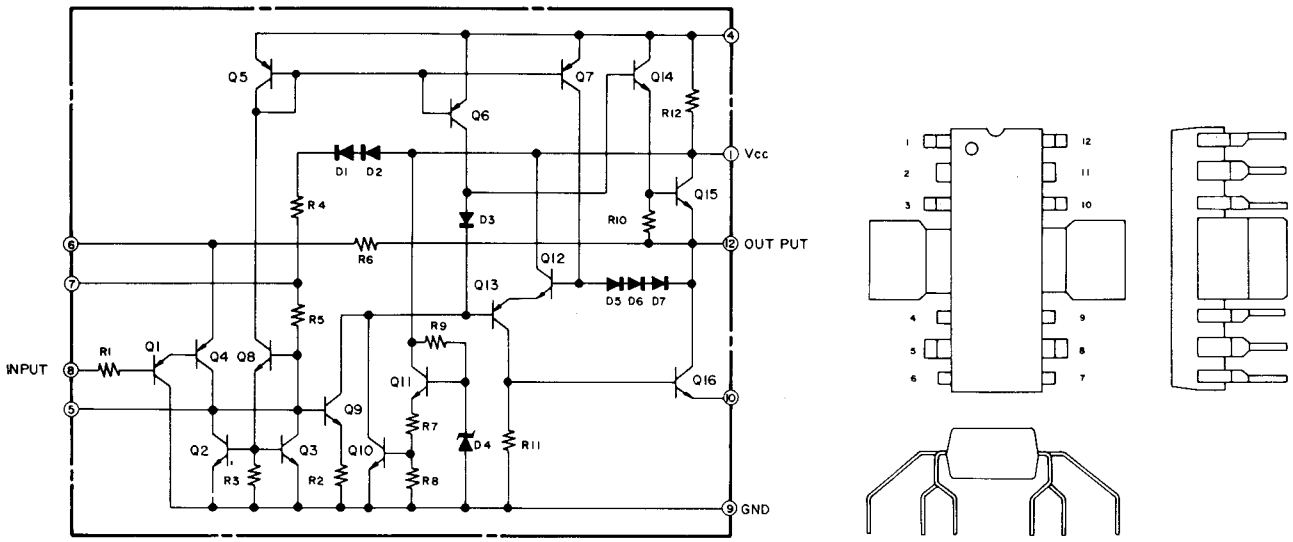


Figure 29-1 EQUIVALENT CIRCUIT

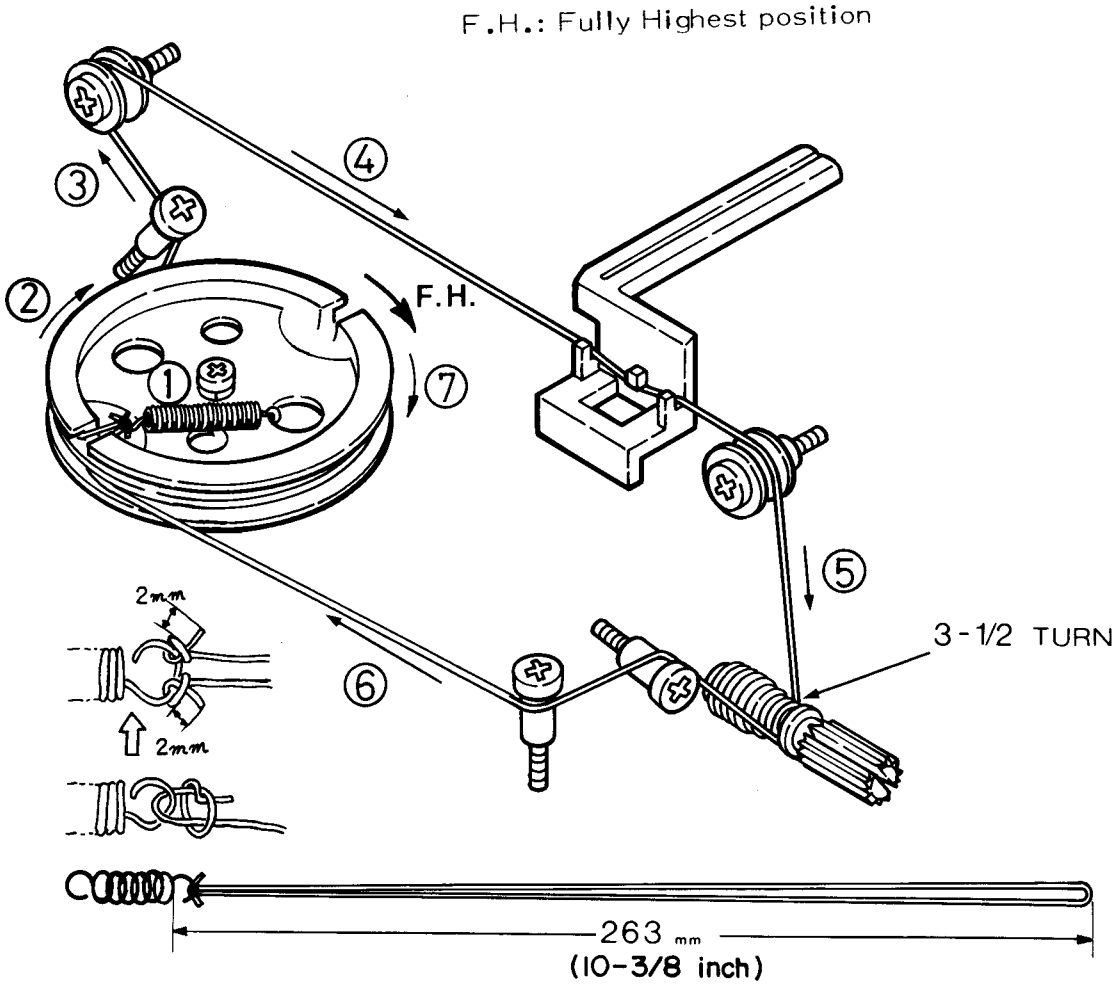


Figure 29-2 DIAL CORD STRINGING

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE
		TRANSISTORS	
Q1	VS2SC535-B/-1	FM RF Amp.	AD
Q2	VS2SC461-B/-1	FM Mixer	AC
Q3	VS2SC535-C/-1	FM Oscillator	AD
Q4	VS2SC460-C/-1	1st FM IF Amp.	AC
Q5	VS2SC460-B/-1	2nd FM IF Amp.	AC
Q6	VS2SC460-B/-1	3rd FM IF Amp.	AC
Q7	VS2SC460-C/-1	4th FM IF Amp.	AC
Q8	VS2SC460-C/-1	AM Mixer	AC
Q9	VS2SC460-B/-1	AM Oscillator	AC
Q101	VS2SC900-E/-1	Equalizer Amp.	AD
Q102	VS2SC945LK/-1	Equalizer Amp.	AC
Q103	VS2SC900-E/-1	Equalizer Amp.	AD
Q104	VS2SC945LK/-1	Equalizer Amp.	AC
Q105	VS2SC1740R/-1	APSS Signal Mixer	AC
Q106, Q107	VS2SC945LP/-1	ALC Amp.	AC
Q108	VS2SC945LP/-1	Line Amp.	AC
Q109	VS2SC1740R/-1	Line Amp.	AC
Q110	VS2SC945LP/-1	Line Amp.	AC
Q111	VS2SC1740R/-1	Line Amp.	AC
Q112	VS2SC458-D/-1	Bias Oscillator	AC
Q201, Q202	VS2SC1740Q/-1	Crosstalk Amp.	AC
Q203	VS2SD468-C/-1	Ripple Filter	AE
Q301, Q302	VS2SC1740R/-1	APSS Limiter Amp.	AC
Q303, Q304	VS2SC1740R/-1	APSS Level Comparison	AC
Q305	VS2SA733///-1	APSS Differential Amp.	–
Q307	VS2SD468-C/-1	APSS Solenoid Switching	AE
Q308	VS2SC1740Q/-1	APSS Indicator Circuit	AC
Q309, Q310	VS2SC1740S/-1	Auto Stop Differential Amp.	AC
Q311	VS2SC1740Q/-1	Auto Stop Switching	AC
Q312	VS2SC1740Q/-1	Auto Stop Multivibrator	AC
Q313	VS2SC1740S/-1	Auto Stop Multivibrator	AC
		INTEGRATED CIRCUITS	
IC1	RH-IX1021AFZZ	FM Multiplex Demodulator	AN
IC201, IC202	RH-IX1020AFZZ	Audio Amp.	AN
		DIODES	
D1, D2	VHD1S2473//-1	Static Protector	AB
D3	VHC1S2790-Y-1	FM AFC	AD
D4	VHVHV46-G//-1	Bias Stabilizer	AC
D5	VHD1N60////-1	SW/MW/LW Detector	AC
D6, D7	VHD1N60////-3	FM Detector (Matched Pair)	AH
D8	VHD1N34A///-1	AM Tuning Detector	AC
D9	VHD1N60////-1	AM Overload	AC
D10	VHPREDLIT503F	FM Stereo Indicator	–
D11	VHD1S2076//-1	FM Overload	AG
D12	VHD1S2473//-1	Static Protector	AB
D101	VHD1S2076//-1	ALC Time Constant	AG
D102, D103	VHD1S2076//-1	APSS Muting	AG
D104, D105, D106, D107	VHD1N34A///-1	ALC Detector	AC
D108, D109	VHD1N60////-3	ALC Bias (Matched Pair)	AH
D201	VHEHZ6-B///1F	Voltage Regulator	AD
D202, D203, D204, D205	RH-DX1006AFZZ	Power Supply Rectifier	AC
D301, D302	VHD1N34A///-1	Voltage Doubling Rectifier	AC
D303	RH-DX1005AFZZ	Counter Current Braking	AC
D304	VHD1N34A///-1	Trigger, Auto Stop Circuit	AC
D306	VHEHZ5-B///-1	Voltage Regulator	AD
		COILS	
L1	RCILC0019AFZZ	FM Antenna	AA
L2	RCILC0018AFZZ	FM Antenna	AA
L3	RCILC0018AFZZ	Choke	AA
L4, L5	RCILR0112AFZZ	FM RF	AA
L6	RCILC0030AFZZ	Emitter Choke	AC
L7, L8	RCILR0118AFZZ	FM Oscillator	AA
L9	RCILA0255AFZZ	SW Antenna	AE
L10A, B	RCILA0353AFLA	LW/MW Antenna	AK
L11	RCILB0309AFZZ	SW Oscillator	AE
L12	RCILB0292AFZZ	MW Oscillator	AD
L13	RCILB0353AFZZ	LW Oscillator	AD
L14	RCILF0014AGZZ	Choke	AC
L15	RCILM0006AFZZ	19kHz Doubler	AF
L16	RCILM0007AFZZ	38kHz Doubler	AF
L104	RCILB0374AFZZ	Bias Oscillator	AF
L105	RCILB0376AFZZ	Bias Step-up	AE
L201	RCILF0014AGZZ	Choke, Motor Noise	AC
		FILTERS	
FL1	RFILF0009AFZZ	10.7MHz, 2nd IF	AE
FL2	RFILF0064AFZZ	57kHz Sub-carrier Trap	–
		TRANSFORMERS	
T1	RCILI0157AFZZ	FM 1st IF	AE
T2	RCILI0157AFZZ	FM 2nd IF	AE

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
T3	RCILI0157AFZZ	FM 3rd IF	AE
T4	RCILI0185AFZZ	FM Discriminator	AE
T5	RCILI0182AFZZ	FM Discriminator	AE
T6	RCILI0154AFZZ	AM 1st IF	AD
T7	RCILI0179AFZZ	AM 2nd IF	AD
T8	RCILI0170AFZZ	AM 3rd IF	AD
T101, T102	RTRNI0065AFZZ	Recording Amp.	AF
T201	RTRNP0433AFZZ	Power Supply	AW
PACKAGED CIRCUITS			
M1	RMPTA0102AFZZ	455kHz Filter	AC
M2, M3	RMPTA0064AFZZ	38kHz Filter	AE
HALL DEVICE			
	RH-MX0002AFZZ	Auto Stop Sensor	–
CONTROLS			
VC1, VC2, VC3, VC4, TC1, TC2, TC3, TC4	RVC-R0054AFZZ	Variable Capacitors, Tuning with Trimmers TC1: FM RF Trimmer TC2: FM Oscillator Trimmer TC3: SW Antenna Trimmer TC4: MW Antenna Trimmer	AR
TC5	RTO-H1009AFZZ	LW Antenna Trimmer	AC
TC6, TC7, TC8	RTO-H3050AFZZ	TC6: SW Oscillator Trimmer TC7: MW Oscillator Trimmer TC8: LW Oscillator Trimmer	AF
VR101	RVR-M0008AFZZ	1K ohm (B), Bias Current Adjust	AC
VR102	RVR-M0061AGZZ	3K ohm (B), Bias Current Balance Adjust	AC
VR201-A, B	RVR-A0109AFZZ	5K ohm (A), Volume Control	AN
VR202-A, B	RVR-A0110AFZZ	10K ohm (A), Tone Control	AK
ELECTROLYTIC CAPACITORS			
C24	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C40	VCEAAU1AW107Y	100MFD, 10V, +50 –10%	AB
C42	VCEAAU1AW336Y	33MFD, 10V, +50 –10%	AB
C50, C53	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD
C54	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C56	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD
C80	VCEAAU1EW475R	4.7MFD, 25V, +150 –10%	AB
C85	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD
C86	VCEAAU1EW335R	3.3MFD, 25V, +150 –10%	AB
C87	VCEAAU1AW336Y	33MFD, 10V, +50 –10%	AB
C90	VCEAAU1AW107Y	100MFD, 10V, +50 –10%	AB
C91, C92	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD
C96	VCEAAU1CW336Y	33MFD, 16V, +50 –10%	AC
C101, C102	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD
C103	VCEAAU1EW335R	3.3MFD, 25V, +150 –10%	AB
C105, C107	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD

REF. NO.	PART NO.	DESCRIPTION	CODE
C110	VCEAAU1EW335R	3.3MFD, 25V, +150 –10%	AB
C112, C114	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD
C117	VCEAAU1AW227Q	220MFD, 10V, +100 –10%	AD
C119, C120	VCAAAU1AB104M	.1MFD, 10V, ±20%	AC
C122	VCEAAU0XW337Q	330MFD, 6.3V, +100 –10%	AD
C123	VCEAAU1AW336Q	33MFD, 10V, +100 –10%	AC
C124	VCEAAU1AW227Q	220MFD, 10V, +100 –10%	AD
C125	VCEAAU1AW336Q	33MFD, 10V, +100 –10%	AC
C126	VCEAAU1AW108Q	1000MFD, 10V, +100 –10%	AE
C128	VCEAAU0XW337Q	330MFD, 6.3V, +100 –10%	AD
C129	VCEAAU1AW336Q	33MFD, 10V, +100 –10%	AC
C130	VCEAAU1AW227Q	220MFD, 10V, +100 –10%	AD
C131	VCEAAU1AW336Q	33MFD, 10V, +100 –10%	AC
C134, C137	VCEAAU1AW227Q	220MFD, 10V, +100 –10%	AD
C138, C145	VCEAAU1CW106Q	10MFD, 16V, +100 –10%	AD
C146	VCEAAU1AW107Q	100MFD, 10V, +100 –10%	AC
C155, C156	VCEAAU1AW336Q	33MFD, 10V, +100 –10%	AC
C201, C202	VCEALU1HW104M	.1MFD, 50V, ±20%	AB
C203	VCEAAU1AW107Q	100MFD, 10V, +100 –10%	AC
C204, C205	VCEAAU1HW105R	1MFD, 50V, +150 –10%	AB
C210	VCEAAU1AW107Q	100MFD, 10V, +100 –10%	AC
C211	VCEAAU1CW228Q	2200MFD, 16V, +100 –10%	AG
C212, C213	VCEAAU1HW105R	1MFD, 50V, +150 –10%	AB
C214, C215, C216, C217, C220, C221	VCEAAU1AW107Q	100MFD, 10V, +100 –10%	AC
C228, C229	VCEAAU1AW108Q	1000MFD, 10V, +100 –10%	AE
C302, C303	VCEAAU1EW335R	3.3MFD, 25V, +150 –10%	AB
C304	VCEALU1CW106M	10MFD, 16V, ±20%	AB
C305	VCEAAU1AW107Q	100MFD, 10V, +100 –10%	AC
C307	VCEAAU1AW476Q	47MFD, 10V, +100 –10%	AC
C308	VCEAAU1AW107Q	100MFD, 10V, +100 –10%	AC
C309	VCEAAU1AW336Q	33MFD, 10V, +100 –10%	AC
C310	VCEALU1HW225M	2.2MFD, 50V, ±20%	AD
C311	VCEAAU1AW227Q	220MFD, 10V, +100 –10%	AD
C402	VCEAAU1AW108Q	1000MFD, 10V, +100 –10%	AE
CAPACITORS			
C1	VCKSPU2GL221M	220PF, 400V (AC), ±20%, Ceramic	**
C2	VCCSPU1HL5R0C	5PF, 50V, ±0.25PF, Ceramic	**
C3	VCCSPU1HL8R0C	8PF, 50V, ±0.25PF, Ceramic	**
C4	VCCSPU1HL5R0C	5PF, 50V, ±0.25PF, Ceramic	**
C5, C6	VCKZPU1HF222Z	.0022MFD, 50V, +80 –20%, Ceramic	**
C9	VCCSPU1HL180J	18PF, 50V, ±5%, Ceramic	**
C10	VCKYPU1HB222M	.0022MFD, 50V, ±20%, Ceramic	**
C12	VCCSPU1HL6R0C	6PF, 50V, ±0.25PF, Ceramic	**
C13	VCCCPU1HH2R0C	2PF (CH), 50V, ±0.25PF, Ceramic	**

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C14	VCCSBU1HL101J	100PF, 50V, ±5%, Ceramic	**
C15, C16	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C17	VCKYPU1HB103M	.01MFD, 50V, ±20%, Ceramic	**
C18	VCCCPU1HH150J	15PF (CH), 50V, ±5%, Ceramic	**
C21	VCCTPU1HH8R0D	8PF (TH), 50V, ±0.5PF, Ceramic	**
C22	VCCTPU1HH180J	18PF (TH), 50V, ±5%, Ceramic	**
C23	VCKYPU1HB103M	.01MFD, 50V, ±20%, Ceramic	**
C25	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C26	VCQYKU1HM103M	.01MFD, 50V, ±20%, Mylar	AB
C27, C28	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C29	VCCSBU1HL151J	150PF, 50V, ±5%, Ceramic	**
C30	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic	**
C31	VCKZPU1HF223Z	.022MFD, 50V, +80 −20%, Ceramic	**
C32	VCCSPU1HL331J	330PF, 50V, ±5%, Ceramic	**
C33	VCCSPU1HLR50C	.5PF, 50V, ±0.25PF, Ceramic	**
C34, C35	VCKZPU1HF223Z	.022MFD, 50V, +80 −20%, Ceramic	**
C36	VCKYPU1HB222M	.0022MFD, 50V, ±20%, Ceramic	**
C37	VCCSPU1HLR50C	.5PF, 50V, ±0.25PF, Ceramic	**
C38	VCCSPU1HL2R0C	2PF, 50V, ±0.25PF, Ceramic	**
C39	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic	**
C41, C43	VCKZPU1HF223Z	.022MFD, 50V, +80 −20%, Ceramic	**
C44	VCCSBU1HL331J	330PF, 50V, ±5%, Ceramic	**
C45	VCCSPU1HL1R0C	1PF, 50V, ±0.25PF, Ceramic	**
C46	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C47	VCQYKU1HM103M	.01MFD, 50V, ±20%, Mylar	AB
C48	VCKYPU1HB103M	.01MFD, 50V, ±20%, Ceramic	**
C49	VCCSBU1HL151J	150PF, 50V, ±5%, Ceramic	**
C51, C52	VCCSBU1HL331J	330PF, 50V, ±5%, Ceramic	**
C55	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C61	VCCSPU1HL8R0C	8PF, 50V, ±0.25PF, Ceramic	**
C62	VCCSPU1HL2R0C	2PF, 50V, ±0.25PF, Ceramic	**
C63	VCCSPU1HL470J	47PF, 50V, ±5%, Ceramic	**
C65	VCKYPU1HB223M	.022MFD, 50V, ±20%, Ceramic	**
C66	VCQYKU1HM333M	.033MFD, 50V, ±20%, Mylar	AB
C67	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C68	VCQSMT1HS332J	3300PF, 50V, ±5%, Polystyrene Film	AB
C69	VCQYKU1HM102M	.001MFD, 50V, ±20%, Mylar	AB
C70	VCCSBU1HL271J	270PF, 50V, ±5%, Ceramic	**
C71	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C72	VCCVPU1HK5R0C	5PF (VK), 50V, ±0.25PF, Ceramic	**
C73	VCCSBU1HL221J	220PF, 50V, ±5%, Ceramic	**
C74	VCQYKU1HM473M	.047MFD, 50V, ±20%, Mylar	AC
C75	VCQSMT1HS151J	150PF, 50V, ±5%, Polystyrene Film	AB
C76	VCCSPU1HL150J	15PF, 50V, ±5%, Ceramic	**
C77	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C78	VCKZPU1HF223Z	.022MFD, 50V, +80 −20%, Ceramic	**
C81	VCCSBU1HL221J	220PF, 50V, ±5%, Ceramic	**
C82	VCQSMU1ES103J	10000PF, 25V, ±5%, Polystyrene Film	AB
C83	VCQSMU1HS222J	2200PF, 50V, ±5%, Polystyrene Film	AB
C84	VCQYKU1HM153M	.015MFD, 50V, ±20%, Mylar	AB
C88, C89	VCQYKU1HM682M	.0068MFD, 50V, ±20%, Mylar	AB
C93	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C104	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C106	VCCSBU1HL221J	220PF, 50V, ±5%, Ceramic	**
C108	VCQYKU1HM333M	.033MFD, 50V, ±20%, Mylar	AB
C111	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C113	VCCSBU1HL221J	220PF, 50V, ±5%, Ceramic	**
C115	VCQYKU1HM333M	.033MFD, 50V, ±20%, Mylar	AB
C121	VCQYKU1HM102M	.001MFD, 50V, ±20%, Mylar	AB
C133	VCQYKU1HM153K	.015MFD, 50V, ±10%, Mylar	AB
C135	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C136	VCQYKU1HM473K	.047MFD, 50V, ±10%, Mylar	AC
C141, C142	VCQYKU1HM102M	.001MFD, 50V, ±20%, Mylar	AB
C143, C144	VCQYKU1HM102K	.001MFD, 50V, ±10%, Mylar	AB
C148, C149	VCCSBU1HL271J	270PF, 50V, ±5%, Ceramic	**
C150	VCQYKU1HM102M	.001MFD, 50V, ±20%, Mylar	AB
C151	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C152, C153	VCCSBU1HL680J	68PF, 50V, ±5%, Ceramic	**
C157, C158	VCCSBU1HL681K	680PF, 50V, ±10%, Ceramic	**
C206, C207	VCQYKU1HM223M	.022MFD, 50V, ±20%, Mylar	AB
C208, C209	VCQYKU1HM682M	.0068MFD, 50V, ±20%, Mylar	AB
C218, C219	VCQYKU1HM104M	.1MFD, 50V, ±20%, Mylar	AC
C222, C223	VCQYKU1HM102M	.001MFD, 50V, ±20%, Mylar	AB
C224, C225	VCQYKU1HM682M	.0068MFD, 50V, ±20%, Mylar	AB
C226, C227	VCQYKU1HM104M	.1MFD, 50V, ±20%, Mylar	AC
C232	VCQYKU1HM153M	.015MFD, 50V, ±20%, Mylar	AB
C233, C234	VCQYKU1HM472M	.0047MFD, 50V, ±20%, Mylar	AB
C235	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C237, C238, C239, C240	VCKZPU1HF103Z	.01MFD, 50V, +80 −20%, Ceramic	**
C301	VCKZPU1HF223Z	.022MFD, 50V, +80 −20%, Ceramic	**
C312	VCCSPU1HL330J	33PF, 50V, ±5%, Ceramic	**
C313	VCKZPU1HF223Z	.022MFD, 50V, +80 −20%, Ceramic	**

RESISTORS

(Unless otherwise specified resistors are 1/4W, ±10%, Carbon type.)

R3	VRD-ST2EY102K	1K ohm	**
R8, R12	VRD-SU2EY470K	47 ohm	**
R16	VRD-ST2EY101K	100 ohm	**
R24	VRD-SU2EY101K	100 ohm	**
R27	VRD-ST2EY333K	33K ohm	**
R31	VRD-ST2EY562K	5.6K ohm	**

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R37	VRD-SU2EY105K	1 Meg ohm	**
R45	VRD-SU2EY471K	470 ohm	**
R46	VRD-SU2EY6R8K	6.8 ohm	**
R47	VRD-SU2EY100K	10 ohm	**
R48	VRD-SU2EY224J	220K ohm, 1/4W, ±5%, Carbon	**
R50	VRD-SU2EY152K	1.5K ohm	**
R56	VRD-SU2EY391K	390 ohm	**
R57, R58	VRD-SU2EY472K	4.7K ohm	**
R61	VRD-SU2EY331J	330 ohm, 1/4W, ±5%, Carbon	**
R62	VRD-SU2EY392K	3.9K ohm	**
R63	VRD-SU2EY220K	22 ohm	**
R64	VRD-SU2EY104K	100K ohm	**
R65	VRD-SU2EY103K	10K ohm	**
R66	VRD-SU2EY821J	820 ohm, 1/4W, ±5%, Carbon	**
R67	VRD-ST2EE222J	2.2K ohm, 1/4W, ±5%, Carbon	**
R103	VRD-ST2EY101K	100 ohm	**
R104	VRD-SU2EY331K	330 ohm	**
R106	VRD-ST2EY101K	100 ohm	**
R110, R111	VRD-ST2EY824K	820K ohm	**
R145, R155	VRD-ST2EY680K	68 ohm	**
R166	VRD-SU2EY470K	47 ohm	**
R174	VRD-SU2EY220K	22 ohm	**
R175	VRD-ST2EY391K	390 ohm	**
R176	VRD-SU2EY470K	47 ohm	**
R221, R222	VRD-SU2EY2R2K	2.2 ohm	**
R223	VRD-ST2EY151K	150 ohm	**
R308	VRD-ST2EY472K	4.7K ohm	**
R314	VRD-ST2EY181K	180 ohm	**
R320	VRD-SU2EY471K	470 ohm	**
R321	VRD-SU2EY181K	180 ohm	**
R322	VRD-SU2EY680K	68 ohm	**
R323	VRD-SU2EY471K	470 ohm	**
R324	VRD-ST2EY820K	82 ohm	**
R326	VRD-SU2EY683K	68K ohm	**
R328	VRD-ST2EY154K	150K ohm	**
R331	VRD-SU2EY181K	180 ohm	**

PICTORIAL PARTS

1	DROLR0010AGZZ	Rewind Roller Assembly	AK
2	GCABA1474AFSA	Cabinet, Front	–
3	GCABB0415AFSA	Cabinet, Rear	AR
4	GFTAB1092AFSB	Lid, Battery Compartment	AE
5	GFTAC1079AFSA	Lid, Cassette Compartment	–
6	HDALP0388AFSA	Dial Scale	–
7	HDAP-0165AFSB	Rail, Pointer	–
8	GCOVA1105AFSA	Decoration, Front	–
9	HDECQ0076AFSA	Decoration, APSS	AG
10	TLABZ0105AFZZ	Label, Cassette Compartment	–
11	HINDM1224AFSA	Decoration, Black	–
12	HINDM1223AFSA	Indication Metal, Model Spec.	–
13	HINDM1226AFSA	Decoration, SHARP GF-8181	–
14	HSSND0216AFSB	Pointer	–
15	JBOTN0062AFZZ	Key Assembly	–
16	JHNDG1059AFSA	Handle	–
17	PSPAN0050AFZZ	Spacer, Handle	AA
18	JKNBK0156AFSB	Knob, Volume Control, Right Channel	AD
19	JKNBN0159AFSA	Knob, Band Selector	AD
20	JKNBN0365AFSA	Knob, Tuning Control	–
21	JKNBN0293AFSA	Knob, Volume Control, Left Channel	AB
22	JKNBN0301AFSA	Knob, Tone Control	AE
23	KCOUB0070AFZZ	Digital Tape Counter	–
24	LX-LZ0053AFSA	Retainer, Handle	–
25	LANGK0166AFFW	Bracket, Cassette Holder Lock Lever	AA
26	LANGQ0456AFFW	Bracket, Tuner Printed Wiring Board	AF
27	LANGR0383AFFW	Bracket, Volume/Tone Control	AC
28	LANGR0384AFFW	Bracket, Power Transformer	AD
29	LANGS0055AFFW	Bracket, Speaker	AA
30	LANGT0207AGFD	Lever, Cassette Holder	AA
31	LANGT0513AFFW	Bracket, Tape Counter	AC
32	LANGT0533AFFW	Bracket, Voltage Selector	AB
33	LANGZ0060AFFW	Bracket, Battery Compartment	AC
34	LBOSG0053AFFW	Boss, Record Interlocking Lever	AC
35	LBSHZ0001AF00	Holder, Pilot Lamp	AA
36	LHLDA1016AFSC	Holder, Telescopic Rod Aerial	AB
37	LHLDC1024AGZZ	Holder, LW/MW Bar Antenna	AA
38	LHLDW3002AFFW	Wire Holder	AA
39	LHLDW3011AGZZ	Wire Holder	AA
40	LHLDZ8055AFZZ	Holder, Built-in Microphone	AB
41	LX-NZ0026AFJB	Nut, External Speaker Jacks	AA
42	LX-WZ0031AGFE	Lockwasher, Internal Type	AA
43	LX-WZ0018AFFW	Washer, Telescopic Rod Aerial	AA
44	LX-WZ3017CEFN	Lockwasher, Shakeproof, External Type	AA
45	MLEVF0545AFFW	Lever, Record Interlocking	AC
46	MLOKC0005AG00	Lever, Cassette Holder Lock	AB
47	MSPRC0011AFZZ	Spring, Dial Cord	AA
48	MSPRC0021AFFN	Battery Terminal, Spring Type	AA
49	MSPRK0053AFFJ	Spring, Level Meter	AA
50	MSPRP0082AGFW	Plate Spring, Cassette Holder	AB
51	MSPRP0107AFFW	Spring, Record Interlocking Lever	AB
52	MSPRT0107AGFJ	Spring, Cassette Holder Lever	AA
53	MSPRT0172AGFW	Spring, Cassette Holder Open	AB
54	NBLTK0048AG00	Belt, Mechanism Drive	AD
55	NBLTK0104AFZZ	Belt, Tape Counter Drive	AC
56	QFSHD1001AGZZ	Holder, Fuse	AB
57	NDAIR0053AGSB	Turntable, Take-up/Supply	–
58	NDRM-0040AFZZ	Drum, Dial Cord	AB
59	NFLYC0009AGFD	Flywheel	AL
60	NPLYB0001AFZZ	Pulley, Dial Cord Drive	AB
61	NPLYC0101AFFD	Shaft, Dial Cord Drive Pulley	AA
62	NPLYR0023AGZZ	Slip Roller Assembly	AK
63	NROLV0003AFZZ	Fast Forward Roller Assembly	AG
64	NROLY0003AFZZ	Pressure Roller Assembly	AE
65	NSFTD0010AFFW	Drive Shaft, Dial Cord	AD
66	PCOVM1005AGFA	Washer, Capstan Oil Cut	AA
67	PCOVM7050AFZZ	Cover, Masking	AA
68	PCOVW3106AFZZ	Cover, AC Socket	AD
69	PCUSG0023AF00	Cushion, Cassette Holder	AB
70	PCUSU0092AG00	Cushion, Battery Compartment Lid	AA
71	PCUSU0128AFZZ	Cushion, Coils (L4, L5, L7, L8)	AA
72	PFLT-0130AG00	Felt, Cassette Holder	AA
73	PFLT-0342AF00	Felt, Mode Selector/Function Selector/Tape Selector	AB
74	PFLT-0274AF00	Felt, Speakers	AA
75	PITOT0305AF00	Dial String	–
77	PCUSS0071AF00	Cushion, Rubber, 10 x 15 x 18mm	AB

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
78	PSPAI0106AFZZ	Spacer, Battery Terminals	AA
79	PSPAV0052AFZZ	Tube, FM Stereo Indicator	AA
80	PTPEC0005AG00	Ribbon, Battery Compartment	AA
82	PZETV0007TAZZ	Cover, Tip	AA
83	QACCK0050AFZZ	Power Supply Cord	AM
84	QANTR0109AFZZ	Telescopic Rod Aerial	AN
86	QHWS-3001AGFN	Lug Terminal, Ground	–
87	QLUGP0105AGZZ	Lug Terminal	AA
88	QLUGP9001AFFN	Lug Terminal	AA
90	QPLGS0103AGZZ	Erasing Plug	AE
91	QPRBF0076AFZZ	Printed Wiring Board, Tuner	–
92	QPRBF0065AFZZ	Printed Wiring Board, Audio Amp.	–
93	QPWBF0458AFZZ	Printed Wiring Board, FM Stereo Indicator	–
94	QPWBF0459AFZZ	Printed Wiring Board, Power Supply Circuit	–
95	QPWBF0460AFZZ	Printed Wiring Board, Hall Device	–
96	QTANB012ZAGZZ	Battery Terminal, Positive Side	AB
97	QTIPF0001CEYW	Tip	AA
98	RHEDA0053AFZZ	Head, Erase	AK
99	RHEDH0052AFZZ	Head, Record/Playback	AW
100	RMICC0057AFZZ	Built-in Microphone	AK
101	RMOTM0035AGZZ	Motor	AY
102	LX-WZ7052AFZZ	Retainer, Telescopic Rod Antenna Lead	AA
103	QPRBF0066AFZZ	Printed Wiring Board, Volume/Tone Control	–
104	LX-WZ5012AGZZ	Washer, ϕ1.25mm x ϕ4mm x 0.25mm	AA
105	LX-WZ5049AGZZ	Washer, ϕ3.2mm	AA
106	LX-WZ5020AGZZ	Washer, ϕ1.7mm x ϕ3.2mm x 0.25mm	AA
107	LX-WZ5015AGZZ	Washer, ϕ3mm x ϕ5.4mm x 0.25mm	AA
108	PSLDC3059AFZZ	Shield, Record/Playback Switch	AB
109	PFLT-0128AF00	Felt, 10 x 90mm	AA
110	PSPAI0110AFZZ	Spacer, Front Cabinet	AA
111	LHLDW1054AFZZ	Wire Holder	AA
121	LCHSM0221AFZZ	Mechanism Chassis	–
122	LCHSS0110AFZZ	Sub-chassis	–
123	MLEVF0536AFZZ	Lever, Over Stroke Absorbing	–
124	MLEVF0308AGFD	Lever, Record Safety	–
125	MLEVF0537AFZZ	Lever, Auto Stop	–
126	MLEVF0270AGZZ	Lever, Fast Forward Roller	–
127	MLEVF0538AFFD	Lever, Record Interlocking	–
128	MLEVF0457AGFD	Lever, Brake	–
129	MLEVF0585AFFD	Lever, Brake Interlocking	–
130	MLEVF0584AFFD	Lever, Fast Forward	–
131	MLEVF0459AGFD	Lever, Pause Interlocking	–
132	MLEVF0539AFZZ	Lever, APSS Interlocking	–
133	MLEVF0540AFZZ	Lever, APSS Key Release	–
134	MLEVF0542AFZZ	Lever, Pause Interlocking	–
135	MLEVF0543AFFD	Lever, APSS Switch Interlocking	–
136	LANGF0330AFZZ	Bracket, Solenoid	–
137	LANGT0172AGFD	Bracket, Motor	–
138	NROLM0008AGZZ	Roller, Sub-chassis	–
139	NBALS0004AGFJ	Ball, ϕ3mm	–
140	LX-BZ0107AGZZ	Screw, Capstan's Thrust Adjust	–
142	LSLVM0018AGFW	Sleeve, Fast Forward Lever	–
143	LANGT0511AFFW	Bracket, Flywheel	–
144	LANGT0512AFFW	Bracket, Audio Printed Wiring Board	–
145	MSPRC0031AGMN	Spring, Record/Playback Head Azimuth Adjust	–
146	MSPRT0161AGFJ	Spring, Record Safety Lever	–
147	MSPRD0035AGFJ	Spring, Slip Roller Lever	–
148	MSPRP0123AFFW	Plate Spring, Sub-chassis	–
149	MSPRP0111AFFW	Plate Spring, Cassette Retaining	–
150	MSPRT0322AFFJ	Spring, Pressure Roller Lever	–
151	MSPRT0323AFFJ	Spring, Fast Forward Roller Lever	–
152	MSPRT0324AFFJ	Spring, Fast Forward Roller Lever	–
153	MSPRT0105AGFJ	Spring, Rewind Roller Lever	–
154	MSPRT0325AFFJ	Spring, Sub-chassis Return	–
155	MSPRT0326AFFJ	Spring, Auto Stop Lever	–
156	MSPRT0135AGFJ	Spring, Auto Stop Lever	–
157	MSPRC0102AFFJ	Spring, Over Stroke Absorbing Lever	–
158	MSPRT0327AFFJ	Spring, APSS Interlocking Lever	–
159	MSPRT0328AFFJ	Spring, Solenoid Bracket Lever	–
160	LBSHS0001AG00	Cushion, Motor, Rubber	–
162	PFLT-0151AG00	Felt, Masking	–
163	PZETF0029AGZZ	Insulator, Switch (SW-8)	–
164	LHLDW3007AGFD	Wire Holder	–
165	LHLDW3003AFFD	Wire Holder	–
166	LX-BZ0091AGFD	Guide Shaft, Brake Interlocking Lever	–
167	LX-BZ0219AFFD	Screw, Motor Retaining	–
168	LX-NZ0012AGFD	Nut, Brake Lever	–
F201	QFS-C102CAGNI	Fuse, 1AT	AE
J3, J4	QJAKA0026AGS	Jack, External Speaker	AB
J2	QJAKC0007AGZZ	Jack, External DC Power	AE
J1 (A ~ D), SW12	QJAKH0068AF00	J1A, J1B: External Microphone Jack J1C: Headphones Jack J1D: Remote Control Jack SW12: Switch, Beat Canceller	AP
SO1	QSOCA0255AFZZ	Socket, AC	AF
SO2	QSOCD2554AFZZ	Socket, Record/Playback	AF
SO3	QSOCE0551AFZZ	Voltage Selector	AG
SW3 (A ~ H)	QSW-B0092AFZZ	Switch, Function Selector	AK
SW5 (A ~ C)	QSW-B0093AFZZ	Switch, Mode Selector	AH
SW4 (B, F)	QSW-B0094AFZZ	Switch, Tape Selector	AK
SW8	QSW-F0044AGZZ	Switch, Mains	AE
SW10	QSW-F0102AFZZ	Switch, Pause Interlocking	AD
SW9	QSW-F0104AFZZ	Switch, APSS Interlocking	AD
SW11	QSW-F0105AFZZ	Switch, Playback Interlocking	AD
SW1 (A ~ J)	QSW-S0218AFZZ	Switch, Band Selector	–
SW2 (A ~ N)	QSW-S0089AGZZ	Switch, Record/Playback	AQ
ME1	RMTRE0058AFZZ	Meter, Battery Condition/Tuning/Record Level	AT
SOL301	RPLU-0052AFZZ	Solenoid	AN
	CTPEK0057AF01	Cassette Tape	–
	SPAKA0499AFZZ	Cushion, Packing, Left Hand Side	AE
	SPAKA0500AFZZ	Cushion, Packing, Right Hand Side	AE
	SPAKC1121AFZZ	Individual Carton	AK

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
	SPAKT0698AFZZ	Carton, 4-unit	AP
	SSAKA0035AFZZ	Sack, Operating Instructions	AA
	SSAKH0100AGZZ	Sack, Unit	AC
	TCAUA0178AFZZ	Label, Arabic	–
	TGANG1039AFZZ	Warranty Card	–
	TINSL0124AFZZ	Operation Instructions, English/ German/French/Spanish/ Portuguese	–
	TINSZ0095AFZZ	Operating Instructions, Swedish	–
	TLABT0052AFZZ	Label, APSS Patent	–
	TMAPC0488AFZZ	Schematic Diagram	–
	TTAGH0031AFZZ	Tag, English/German/French	–
	UBATU0009AGZZ	Battery	AC
	TLABS0016AGZZ	Label, SEMKO/NEMKO Safety Standard	–
	TLABS0004AGZZ	Label, SEV Safety Standard	–
PL1	RLMPM0020AFZZ	Pilot Lamp, APSS Indicator	AE
SP1, SP2	VSP0010P-254A	Speaker	AR
SW6	Not Available	Part of SO2	
SW7	Not Available	Part of SO1	